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THE

Madras Forest College Magazine.

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Vol. VII. DECEMBER 1922. No. 2.

Catechu Manufacture in South Kanara District.

THREE different substances are derived from the heartwood of "*Acacia Catechu*" viz, *Cutch*, *Kath* and *Keersal*. The first two are obtained by boiling down chips of the heartwood, while the last one is found imbedded in cavities in the wood. *Cutch* is largely exported for dyeing and tanning and is much used for dyeing canvass and fishing nets a brown colour, (The nets are supposed to be considerably stronger and more durable after dyeing, the *Cutch* acting as a preservative) *Kath* or *Katha* is not exported, and is only a product of local importance. and is sold in bazaars: when eaten with Pàn, it imparts a red colour to the lips. *Keersal* is very much employed in Hindu medicine

Cutch which is generally prepared in round balls, is of a dark brown colour, of brittle texture and presenting a smooth surface when cut; while *Kath* and *Keersal* are both of a crystalline structure, the former being greyish and the latter pale brown in colour.

It is not proposed to deal with *Keersal* in the following essay as at present very little is known of its economic importance. *Cutch*, being the most important, it is intended to place before our readers, in the following pages, the manner in which it is, at present, prepared.

The tree *Acacia Catechu* is known by various names; Prain, in his "Journal Asiatic Societies, Bengal," recognizes three varieties, viz:— (1) *Khair*, *Khoirn* or *Kumaonkath* found in Central and Northern India. Calyx, petals and rachis covered with spreading hairs. (2) *Catechuoides*, *Khair*, *Koirusha* found in the North and South Kanara District of the Bombay and Madras Presidency and in Pegu-Burma: Calyx and petals glabrous, rachis puberulous (3) *Sundra*, *Kati Kute* or *Kachu* found chiefly in the Indian Peninsula and Upper Burma: Calyx, petals, and rachis all glabrous. These three varieties are believed to be practically identical in their properties and uses, although there is sometimes a distinction made in the relative value of the products obtained from each. Nothing has so far been conclusively proved as to which of the three varieties is the most valuable commercially.

In the district of South Kanara, the tree is known locally by either the sanskrit name *Kadira*, or the Kanarese name *Kachu*, and is believed to have been used in ancient times for preparing "*Yupa*" (that is, posts to which the animal was tied in religious sacrifices). The extract is also known by the name *Kachu* or *Cacho*. The following account as to the origin of this name appears in "The Commercial Products of India" by Sir George Watt:—

The name *Cachu* would seem to be simply the Kanarese K*achu*, and very possibly gave origin to the modern latin name *Catechu*. In 1,574 Garcia de orta gave a complete account of the plant, and of the manufacture of the extract under its Tamil name of K*ati* (*Cate*), a word, which, by some authors gave the first half of the name *Catchu*, the second being derived from "*Chuna*" to distil. It was not, however, until the 17th century that *Catechu* attracted the attention of Europe. It was then supposed to be natural earth, and as it reached Europe by way of Japan it received the name of "*Terra Japonica*." About the same time, *Gambier* also found its way to Europe, and was designated *Terra Japonica* indiscriminately with *Catechu*. Cleger exploded the mineral notion of these substances, by republishing in 1685 Garcia de orta's account of the preparation of the extract."

There are no statitsical data available regarding the production of K*achu* in South Kanara. The trade has all along been in the hands of a few local merchants and dealers. The Industry is carried on on a small scale only and the mode of manufacture is consequently very crude; but in principle it is much the same as the Kumaon K*ath* manufacture as is carried out in Gonda, in Oudh.

The South Kanara Industry is restricted to certain limited localities marked by the growth of C*atechu* and is confined only to two taluks Coondapoor and Udipi. The tree, though gregarious in a minor degree, does not grow extensively on large areas but occurs in small patches scattered throughout the Unreserves in and around ***Baindur*** and K***okkarne.*** The extent of C*atechu* area may roughly be estimated at 16,000 acres of which nearly 3,000 acres, included within Reserved Forests, are not worked for *Kachu.*

Fifteen tons of K*achu*, are, approxiamately manufactured annually by the Forest Department and an almost equal quantity is put on the market every year by private owners. For the departmental operation about a thousand mature trees are marked from the Unreserves annually and the boiling or extraction of K*achu* is given on contract at fixed rates; smaller trees i e., of not less than 2' in girth yield a better quality and a proportionately larger outturn of K*achu* and are more easily felled than larger trees. However, to ensure a sustained annual yield of *Catechu* tree, it is not advisable to cut down any tree of less than four feet in girth.

The fuel required for boiling is also obtained from the Unreserves of which 2 to 2½ acres of typical South Kanara* *hadies* just sufficient for the season's working) are marked out by the Forest Department. Only unclassified trees are felled and their stumps are properly coppiced. Besides this fuel, the sapwood and branchwood of the *Catechu* trees felled in the operation are also used for boiling.

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* [That is, typical Government wasteland or unreserve.]

The boiling camp consists of a row of grass huts centrally situated (that is, within easy reach of an ensured yield of *Catechu* trees and the required amount of fuel) and in close proximity to a perennial supply of water· The huts, except for the two or three in which the wood is chipped and which have open fronts, are closed on all sides with grass-hurdle walls strengthened with bamboo reepers. The still proper, consists of a raised rectangular platform of stone in mud or clay containing about half a dozen fire places. On these fire places the pots containing the heartwood chips and water are boiled. The erection of the boiling camp and the entire operation is usually given on contract, the department supplying the neceseary materials.

Towards the end of December or the beginning of January, the axe-men go round the forests felling trees already marked, or selecting trees for felling. In selecting a tree, the axe-man cuts a notch on each stem, and is thereby able to see the thickness of the sapwood and the colour and appearance of the heartwood. These factors enable him to decide whether the tree will yield good *Kachu* or not. All selected trees are marked and subsequently felled. Immediately a tree has been felled, its bark and sapwood are removed, and, as stated above, utilised as fuel for boiling the heartwood in water. In private forests, even the stumps are dug up and utilized in the operation as the heart-wood they contain is supposed to yield a better quality of *Kachu* than is obtained from the heartwood of the stem. In Government forests the stumps are coppiced.

The red heart-wood is next removed to the Boiling camp and there chopped into small chips. This is done as follows: The top end of each piece is supported on a forked branch buried vertically in the ground in front of the open sheds and butt end is proped up on a square block of wood, so that the heartwood piece rests in a slanting position. In this position, the heartwood is chipped with a sharp axe into small pieces about 1½ to 2 cubic inches in size. If an adze were used the chips would be much smaller and probably the results obtained would be better— At any rate the chips would require less boiling to yield the same amount of extract— The local workmen (*Kudubies*), however, cannot be prevailed upon to do this, as they are very afraid of the "*Devil*" and believe that some ill will befall them if they replace the method handed down from time immemorial by any other method.

About 6 or 7 ℔s of chips are put into a large pot containing about ten gallons of water and boiled In some parts only four gallons of water are used with six ℔s of chips but, I am not certain which of these two proportions would yield the better result, After about 3 hours, with the application of a steady heat, the water is reduced to half the original quantity and the chips become considerably softened, most of the catechu essence (as it may well be called) having been extracted from them. The resulting liquid, which is thick brown and oily looking is drained into another pot of approximately the same capacity as the original one, while the chips are retained in the first pot, to which 3 to 4 lbs of fresh chips and 5 to 6 gallons of water are added. Both the pots are then heated for another 3 hours, when the liquid in the second pot reaches the consistency of melted pitch. This thicker liquid (now in an almost semi solid state) is then poured out into a shallow oblong boat 4 feet long, 1′6″ broad and 8″ deep made of *Bobmax Malabaricam* (or some other soft wood) and allowed to cool. The thinner oily looking liquid from the first pot is, as before transferred to the second pot, the fresh quantity of chips and water added and the whole again heated. This operation is repeated five or six times until the chips yield no more *Kachu* when they are finally rejected as useless and used as fuel.

The cooling of the thick, almost semi solid substance in the shallow open wooden troughs is hastend by constantly stirring with broad wooden ladles also made of *Bombax Malabaricam* The stirring continues until the consistency of moulded clay is reached, when the substance is sufficiently solid to be rolled into balls- The rolling is done by the *Kudubies* with their hands on hard ground covered by ash, and lasts for nearly two hours. The liqud.

being sticky, the hands are frequently dipped in a supply of cool thinner liquid (especially kept aside for the purpose) to facilitate rolling; water or any other liquid should on no account be used as they materially affect the quality of the *Kachu*.

A decoction which is of poor density indicates an insufficient amount of boiling, and the liquid should be boiled again until the required density is obtained. This often happens in actual practice.

The balls are next dried. Ash plays an important part in this operation, the freshly prepared balls being rolled in ash for a short time and then removed to thin beds of ash 1½ to 2 inches in thickness, arranged in specially prepared sheds and excluded from the direct rays of the sun. Here the balls are allowed to remain for a period of 24 hours, after which they are again rolled in ash on stone slabs when they become considerably softened These softened balls are dried by placing them in fresh ash for 3 or 4 days when they once more become hard This process of alternate rolling and drying (softening and hardening) is repeated three times and is a means of expelling any air bubbles, which may have been enclosed in the interior when the balls were originally rolled, and renders the balls free from cracks and less liable to break The balls are then ready for the fourth or final drying. For this, a pit is dug 6 to 8 feet square by 3 to 4 feet deep and is lined with ash The balls are then closely packed in the pit to within a foot from the top. A six inch layer of ash over the balls and a six inch layer of mud over the ash completes the closing of the pit. It is essential that the maximum quantity of air possible should be excluded from the pit in this last operation. If the balls are found to be hard at the final packing, the ash covering them should be moistened with a little water, so that further drying should not be too rapid. After three or four days the balls are removed from the pit and rolled in dry ash for the last time and placed on a bed of straw on a raised platform in a closed shed where a few days further drying renders them ready for the market

The quality of the *Kachu* may be tested by cutting open a ball. In good *Kachu* the surface should present a clean smooth appearance free from pores or air spaces. Another test is by solution in water; good *Kachu* being insoluble in cold water but easily soluble in hot. The balls should contain white spots (which indicate the presence of good tannin, technically called *Keersal*) and not red ones and should be $2\frac{1}{2}$ to $2\frac{3}{4}$ inches in diameter, heavy and not weighing more than 10,000 to the ton.

The manufacture of *Kachu* balls is generally given on contract and the department pays a rate of almost Rs. 160 per ton. Drying and rolling costs Rs. 125 per ton excluding the price of the trees utilized. The contractor has to make his own arrangements for payment of all labour employed in the operation and he has to provide them with huts.

The best time for *Kachu* manufacture is the winter season, December to March.

The chief market for South Kanara *Kachu* is Hasan, a district in Mysore state, to which all the *Kachu* manufactured in the year is carted. The price obtained there is Rs. 800 to 900 per ton. Since the exact value of the trees utilised in the operation is difficult to estimate, it is not possible to calculate the exact profit per cent; but judging from the contract rate of Rs 160 per ton paid by Government, and the market value of Rs. 800 to 900 per ton, the profit per cent should be appreciably high It would be interesting to work out the exact figures.

The manufacture of *Kachu*, as is carried out in South Kanara, is one of ancient origin and primitive simplicity. Nothing has, or seems to have been done to improve or in any way promote this important industry.

The following are a few suggestions, which are perhaps worthy of attention, and which if carried out, would I am sure, improve matters considerably:–

(a) (1) A thorough investigation into the sylvicultural requirements of Catechu, the best way of treating the areas it occupies, the most suitable season for felling and the possibility of replacing of the present primitive method of manufacture by a more up to date scientific one.

(2) Selecting the most congenial conditions, under which the artificial stocking or restocking of the forests with *Catechu* may be undertaken. The following account appears in the "Sylviculture of Indian Trees" by R. S. Troup page 453:— "It is very subject to damage by browsing, and responds readily to closure to grazing. Porcupines are particularly destructive to the trees, gnawing the back off round their bases and often killing them. Ranger Basti Ram reports that he has found a smearing of lime efficacious in keeping them off. An American plan for dealing with porcupines is to soak small boards in brine and strychnine and nail them to the bases of trees; the porcupines have a partiality for salt and gnaw the boards, dying of strychnine poisoning"

(b) Technically training the poorer classes (locally known as *Kudubees*) and making them efficient to carry on the industry properly and

(c) Increase of transport facilities. At present the facilities which exist are few.

The *Kachu* industry, though at present undertaken on a small scale, is one with great possibilities and if undertaken on more business like lines would almost certainly prove to be a most profitable source of revenue. There is no need to emphasise, that the growth of Indian Industry in general, and this in particular, depends ultimately upon trained workers, scientific administrators and enterprising capitalists; and no progress is possible without a systematic training of *all the workers* engaged in the industry. At present there is a great deal of *room* for improvement.

K. SANKARANARAYNA RAO,
M. F. C. 21—23 DN.

"Discuss the present campaign against the Forest Department. Is it a true reflection of public feeling?"

Second Essay for the Indian Forester Prize for past Students, for 1922. —By Mr. L. A. Krishna Ayyar B. A., M. R. H. Range officer, Santanpura, Travancore.

Introduction

In dealing with this subject, a Forest Officer will be between the horns of a dilemma, as it is not a purely Forest qusetion. For a thorough handling of the subject, an acquaintance with current politics is a desideratum, and the writer desires to be excused for trespassing on politics.

It is an acknowledged fact that, under all constitutional Governments, the will of the people should prevail in matters affecting the interests of a country. When the Forest Commissioner was about to be divested of his control over the Forest Department in 1918, this view partly found its expression in his speech thus:— "The Government will have to adjust the demands of Forest experts to the Agricultural needs, the habits and even the prejudices of the people. As the masses of the people become more educated and articulate, they will bring increasing pressure on the Government. The effect of the forthcoming political changes has to be taken into account. The moral for the Forest Department is that it must try to remove all possible causes of friction between itself and the people as soon as possible [1]." If this truly represents the correct Forest policy of the Government, we have to see how far the Forest Department, which has been since on its trial, has met and eased the situation.

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[1] Indian Forester, 1918- page 495.

Proceedings of the Madras Legislative Council in 1921.

Recent happenings have however given occasion to gloomy forebodings as to the future of the Department. The refusal of the Legislative Council to vote supplies for the erection of a saw-mill at Russelkonda, the passing of resolutions on the disafforestation of Forests in the vicinity of villages and the improvement of grazing grounds in 1921 have given a rude shock to Forest Officers.[1] In the Administration Report of Madras Forests in 1920, it found its expression thus:— " A full knowledge on the part of the leaders of the people of the facts connected with the forests and of the aims and objects of the Forest Conservancy would do much to dispel some of the antagonism." Though these remarks afford considerable food for reflection, there is no need for despondency. The Government can always count on the support of the Indian Councillors. As Forest administration forms a reserved subject, there need be no alarm on the part of Forest Officers, provided the Councillors are taken into confidence. In this connection it would be pertinent to draw attention to the experience of Mr. Billson, Chief Conservator. "Only personel contact with elected members will enable the chief Conservator or the Senior Conservator as the case may be, to push on with his ideas,".................................

I was much impressed with the willingness of all I addressed to be convinced when arguments were placed before them Slight

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1. Please refer to proceedings of the Legislative Council 3rd August, 1920. 22nd March 1921, and Governor's veto vide G. O. No. 46S Development dated 26—3—1921.

distrust of our motives to a large extent disappeared, but the essential to the final extinction of that mistrust is, figuratively speaking, the placing of the whole of one's cards on the table and the concealment of absolutely nothing".[1] This is worthy of being emulated in the Madras Presidency, and I am sure trust will beget trust.

So far as this Presidency is concerened, the passing of resolutions on disafforestation of all Reserved and Protected forests in the vicinity of villages and the improvement of grazing ground is of immediate interest.[2] These two problems have to be solved in a statemanlike manner.

1. Disafforestation of all and protected forests lying within one mile of Occupied area in any village.

As a result of the labours of the Horne Committee, the Government of Madras classified the forests of the Presidency under six heads. Forests under classes V and VI constitute what are called village forests. They are entirely managed by the Forest Panchayats under the supervision of the Revenue Divisional Officer. The above resolution of Mr. Muniswami Naidu, aims at further surrender of valuable forests to the Forest Panchayats, and this has to be viewed dispassionately.

The question that now arises for determination is what percentage of the area of a country should be maintained as forest. In France and Germany, it was laid down some years ago that for a country to be at its best, 25 per cent of the surface of the country should be maintained under forest.*

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[1] Indian Forester 1921. page 317.

[2] Proceedings of the Madras Legislative Council dated 3rd August, 1921.

* F. A. Lodge, Forest Policy and Forest Management page 3.

Let us view from practical politics what disaforestation would mean for the Madras Presidency in terms of the present resolution. In the Madras Presidency, cnly, about 15 per cent of the whole country is under forests.

Further in 1911, the population of the Madras Presidency was returned as 414 lakhs The fuel worked from the Forest areas amounted to 221 lakhs of C. Ft., i e. about 2¾ lakhs of tons. At even a pound per day rate, the total demand for fuel in the Province during the year would have come to over 70 lakhs of tons. That is only 4 per cent of the demand at this very low rate could have been met by our forests during that year, even if all the torest fuel went to satisfy domestic uses only[1] Since then, the evidence of Forest Officers before the Industrial Commission was almost unanimous in denying the possibility of getting much more out of our forests than we do now[2] A similar note is struck by Mr. Cox in his report on the Madras Forest Department of 1920. " The truth is that the present forest resources are already insufficient to meet the demands of a vast agricultural population and that relaxation of Conservancy or actual disafforestation widens the gap between supply and demand.

" Experience has shown that if these forests are left entirely to the mercy of the villagers, they rapidly disappear. The present generation eats them up regardless of the requirements of future

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1. Indian Fuel problem by Rao Bahadur K. V. R. Iyengar M. A.
2. Do. do page 18. [page 10.

generation"[3] Sir Lionel Davidson in opposing another resolution, remarked "Due partly to ignorance, and partly to selfishness, those bodies mismanaged the class of forests and had proved themselves unfit to govern them."

Duty of the State.

It has to be first recognised that "the State is responsible for the maintenance of those forests in the interest of the future and see that the present generation does not diminish the invested capital. In other words, village forests have to be managed as carefully as state forests."[4]

Remedy.

What has been above stated is a cold storage of facts which require serious reflection at the hands of the leaders of the people. However, the grievances of ryot are not fancied. They have to be met half way. If there is any imperfection in the present organisation and management of the forests by the forest Panchayats, these have to be made not only perfect but there should be separate organisation to supervise the working of the Panchayats. Just as each District Board has its own Engineer, Medical Officer, and others it should have on its Staff a Forest Officer of the status of an Assistant Conservator for the management of the "District village Forests" with a Conservator of forests at the head of the administration analogous to the Inspector of Municipalities and District Boards. This would lighten the work of the Forest Department, while it has the advantage of meeting popular demands.

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[3] Notes on Forest Policy and Forest Management Pages 8, 9.
[4] Do. do. 9.

2. Improvement of grazing grounds.

The resolution of Mr. Vellingiri Gounder,[2] aimed at increasing grazing facilities by improvement and development of grazing areas, and providing water supply for cattle in the grazing blocks

The Madras Government have already improved grazing facilities on the lines of the Horne Committee, and the present resolution aims at further liberalisation of the measures already taken by Government. Sir Lionel Davidson opposed the resolution on the ground that any money spent on improving grazing areas in unsuitable soil would be much better spent in raising fodder crops in good soil and that the attempt to cultivate grass in forests where there was promiscuous grazing ended in failure. Though there is much force in this, Government have already signified their interest in the improvement of grazing grounds. During 1919-20. about Rs. 10,000 was spent by government on improving water supply within the forest for the benefit of cattle. The grazing revenue amounted to Rs. 8,53,555. In their review of the Department, the Government pointed out that additional income was in no sense, the main object of the Government. Government are already partially committed to the policy of improvements to grazing areas on the lines of the resolution, and so long as additional income is not the main object, additional funds can be ear-marked for the improvement of grazing blocks.

As Mr. Lodge points out, the gift of a village Forest is a generous act on the part of the State, and care must be taken to limit the extent of the gift to the area of forest necessary to supply the actual domestic requirements of the village.[1]

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[2] Proceedings of the Madras Legislative Council dated 3rd August, 1921.

The management of village forests by the Forest Panchayats has already been pointed out to be a dismal failure They should be remodelled on the lines already indicated. As Mr. Elphinstone points out, our principal instrument must continue to be the Panchayat, though one may not agree with him, when he says 'that must be exempt from all new forms of interference and regulation on our part.'

It has already been pointed out that "a fuller knowledge of the part of the leaders of the facts connected with forests would do much to dispel some of the antagonism." In other words, a sound forest opinion has to be created in the country. This leads us to the subject of Forest Education.

In this connection, there are three avenues along which advance may be made :—

1. Development of education in the higher branches of Forestry.

The present method of imparting instruction through the Imperial Forest College at Dehra Dun and the Provincial forest colleges will not be adequate to meet the demands of the Empire.

Here we have to follow the wake of the English Universities, and benefit by them. Burma, however, holds the palm, as Sir Harcourt

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[1] Notes on Forest Policy and Forest Management Pages 8-9.

Butler said in 1917, "I am one of those who hope there will be a Forest faculty in the future University of Burma.[1]

The recommendations of the Calcutta University Commission have not come up into line with this pronouncement. They say "We think that, for the present, advanced training in Forestry can be most economically dealt with by the Imperial Forest College at Dehra Dun,

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but we should not like to exclude the possibility of developing in Bengal at some future time training in, at any rate, some of the special branches of Forestry."[2] That day will be a red-letter day when each of the Indian Universities, following in the wake of Burma and the United Kingdom, establishes chairs of Forestry and special courses of Botany. Even the Committee presided over by the Rt. Hon. Lord Clinton recommends that existing University courses should be co-ordinated to bring them up to a common level and to utilise them as a preliminary to a higher course of training at a central Institute.[3]

2. The other avenue along which advance is desirable is the promotion in the public mind of greater interest in Forest matters. This can be done by making the journals of the land more readable to lay men, and through the Publicity Bureau as in Madras.

3. Lastly, public attention should be drawn to the urgency and gravity of the question and it should form the special study

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1. Indian Review 1921 page 174.
2. Calcutta University Commission Report Vol. II, page 149 150.
3. Indian Forester 1921, page 374.

of experts. This can be done through the Standing Forest Committee and organisation of Annual District Forest Conferences. The Madras Government have done well in appointing a Standing Forest Committee for it will be an asset to development as well as to educate the people on forest matters.

From what has been said above, it may be clear that a Forest Officer cannot afford to live in a world of his own. He must rise to meet the present situation He is on his trial. Should he fail to do so he will be left out of the race. "Folly is that wisdom which is only wise behind hand." Therefore "awake, arise, or be for ever fallen"

"YE AND YOUR FATHERS HAVE SOWN THE WIND,
YE SHALL REAP THE WHIRLWIND."

The Working of Sandal Areas in Dharmapuri Range.

Dharmapuri Range is situated in the North Salem Forest District, the Range Head Quarters being at Dharmapuri, a comparatively large town on the Morappur–Hosur narrow guage Section of the South Indian Railway. Though the Head Quarters of the Range is Dharmapuri the Forests comprising it are situated at about 20 miles distant from the Head Quarters.

These Forests consisting of 8 Beats and including 10 Reserves form one compact Block, situated on the North–Western side of the Dharmapuri Taluq. Irregular patches of Sandal lie scattered throughout the Block. Some of the Reserves contain fairly large villages; while in others, especially in those containing Sandal, the villages are small and few and far between. The *Woddapatty* and the *Guthirayan* Reserves, in which the main Sandal areas occur, are practically devoid of villages.

The areas supporting Sandal form a Series of upland plateaus, hills, and valleys, the elevation varying from 1000 feet to 4577 feet, the latter elevation being the summit of the *Guthirayan* Hills. Excepting the steep slopes and ridges, which are stony and bare, the soil is a red loam on the hills and dark alluvial clay in the valleys.

The climate is moderately hot in Summer and mild in Winter The annual rainfall is about 30 to 35 inches.

The chief timber species are *Chloroxylon Swietenia Hardwickia Binata* and some of the *Albizzias. Teak* is found poorly distributed on the slopes of the *Guthirayan* hills and *Rosewood* is seen occasionally in the *Bavanur* and *Woddapatti* Reserves along the banks of the Cauvery. Sandal is found in a mixed crop and occurs in large patches, most of which consist of young growth and which may, in due course, form typical sandal areas, provided the young growth is tended and protected.

There is no systematic working plan as in the case of the *Denkanikota* and *Anchetti* Ranges A preliminary working plan was drawn up in 1916 by Mr. B. R, Salisbury the then Range Officer and according to this preliminary plan, the Sandal areas are divided into two series "A" and "B", each series containing six coupes. This actual division of the area into two series is based on the particular kind of work to be done in each series. In "A" series, fellings are carried out and are followed by tending and cultural operations; but in series "B", the main object is to obtain artificial regeneration of sandal, there being no principal felling operations.

Until 1918, the work was conducted by the Forest Guards under the supervision of the Section Officers, who took care to see, that a certain quantity of Sandalwood was collected annually cleaned and despatched for sale merely to show a certain amount of work and to satisfy the District Forest Officer. In 1918 however, a Deputy Ranger and two Forest Guards were deputed, to be engaged solely in extending and improving the existing Sandal by cultural and tending operations on a comparatively large scale. As this special staff was not engaged until late in the year 1918, coupe I (*Marandahalli* South) of "A" series, to be worked in 1918, was not satisfactorily worked and a very large number of dead trees were omitted in the enumeration and the total yield amounted to only about 4½ tons.

In 1919, Coupe II (*Guthirayan* Reserve) was taken up for working. As mentioned above this is an area almost entirely devoid of villages, so that, when the new staff was posted, the subordinates were able to find only a few wild, half-naked "*Irulers.*" With great difficulty these hill men were collected together and provided with food and clothes; and their fear for civilized people was gradually removed. The District Forest Officer was addressed on their behalf and a few acres of land was distributed among them at one or two acres per head. With the help of these people, the main Sandal area, portions of which had not yet been visited by the Forest Subordinates, was thoroughly explored, and a quantity of 15 tons of dead Sandalwood was extracted and despatched to *Tirupattur.* It is very interesting to note that instances of theft, practically unknown in other parts of the Range appear to have been a common occurrence in these remote ond unfrequented parts. Sandal trees of all ages were found to be indiscriminately hacked by graziers, the leaves being used for teeding their cattle. The stripping off of the bark was also much in evidence (the local graziers and villagers using it for their own consumption as a substitute for areca nut) Steps were immediately taken by the Range Officer to stop this illicit removal and wanton destruction of Sandal and I am sure that, by this time, matters must have improved considerably.

Sowings also were undertaken and about 100 acres in each of the *Bavanur, Guthiroyan* and *Pennagaram* Reserves were sown with Sandal but owing to the failure of rains, not even 10 per cent of the seeds germinated.

Until 1917 all operations (i e. final cleaning and billetting which I will deal with in the next issue of our magazine) connected with the extraction of Sandalwood, were done in the Forest at some selected spot chosen mainly with regard to available labour The finally cleaned wood was transported in headloads to the nearest road, whence it was carted to the nearest Railway Station. It was then despatched by rail to Tirupattur, which forms one of the sale depots for Sandalwood in the fourth circle. By this system of working the, finally-cleaned wood, was exposed to the variations of weather, with the result that its quality was considerably reduced ; cracks, loss in colour and scent due to evaporation of the Sandal oil being the most important defects. In addition to these defects, the possibility of theft, in this method of exploitation, might easily be placed at the maximum, the place of final cleaning being at a considerable distance from the Railway Station and in the Forest itself.

In 1917-18 this system of cleaning and transport was completely changed, and the following more satisfactory system adopted. A central depot was constructed at *Dharmapuri,* on the railway and the final cleaning of the wood is done here. The sandalwood obtained in the operatin is only rough cleaned in the forest—that is the heartwood is left with a thin layer of Sapwood to protect it from being damaged by the weather. This roughly cleaned wood is transported to the depot at *Dharmapuri,* where it is finally cleaned immediately packed in gunnies and loaded on to the train for Tiruppattur. By this system the wood is not only not exposed to deterioriation, but the chances of theft are consbideraly reduced.

In 1920 *Tholuvabetta Extension* Reserve Forest was worked but the special duty Forester in charge of the operation frequently fell ill on account of the malarial conditions prevalent in the locality. The result was that the work was not properly carried out and the total yeild was only about 2½ tons.

In 1921, *Madappanur* unreserve was successfully worked and a quantity of nearly 6½ tons was despatched for sale.

This new system of cleaning and transport has solved the problem of placing on the market Sandalwood of the highest quality with as little loss as possible due to theft.

S. Rangaswami Iyengar,
M. F. C. 1922—24 Dn.

"Why I adopted forestry as my profession."

—Second Essay for 'The Indian Forester Prize for M. F. C. Students, 1920—22—By Mr. K. A. Bhandari M. R. Hons (1920-22 Dn.)

It is not in mortals to command success.
But we will do more -deserve it.

Forestry in India as a profession does not occupy such a prominent place as it ought to, the public having no high appreciation of it. This is mainly due to the fact that people have no idea about forests and their management. From the numerous cases that arise between the ryots and the forest department public are led to believe that the department is opposed to their interests. The forest college trains up sufficient number of rangers from the deputy rangers' class. Non-stipendiary students rarely come to the college, because they have no great demand. Two big projects are in the move now, the Russelkonda Saw-mills and the Dhoni-scheme. On the profitable working of these depends to a great extent the popularity of the forest department and the sanction of many more of such projects These schemes necessarily want more trained men, and the keeness with which it will be competed for will to a degree gauge the public opinion gained.

At present the importance of forest conservancy in India is not realised by the ryots and people in general Under this head the forester has two separate duties :—

Firstly to convince the ryots as to the necessity of maintaining forests and protecting them against external injuries and secondly to tell our educated Indians and Legislative Council Members, about the vast resources of the Indian forests, and how by investing a comparatively small capital on modern schemes, we could place India's forest resources on a more industrial and commercial basis and thus join the most advanced nations of the world in the development of the greatest of natural resources.

As regards the first, we have to tell the people how the indiscriminate exercise of rights and privileges interfere with the systematic working of the forests and the extent of the injuries done to the forest by overgrazing and fire. Then we must impress on them the necessity of maintaining forests to prevent extremes of climate, to increase rainfall to protect the hill slopes from land slips, and erosion and to feed springs, streams and rivers The preservation of the water supply ought to appeal to all ryots as on it depends the success of agricultural crops.

There are, lots of private forests in Canara and Malabar, the districts I know of the only treatment given to them being exploitation of saleable produce. They have no idea about the value of these forests because no information is available to them.

Forest Officers ought to give as much information as they can to all private forest owners and induce them to work their forests on some system, with an eye to the future of these forests, which at present is totally neglected. Thus a forester becomes the creator and guardian of a property which generation after generation enjoy.

The second part of the duty lies with educated Indians and Legislative Council Members. We have to tell them that the vast resources of Indian Forests are as yet little drawn upon. The country is realising about a tenth of the annual products of her forests, while the amount of lumber grown annually would permit her to become a large exporter of lumber with the resulting benefit to her commercial position. India timbers are if not better at least equal to the world's best timbers, and new uses are being found almost every day. Yet

India imports Swedish pine box-shooks, boxes and general structural lumber This year the Indian Railways are importing a large number of treated fir sleepers from British Columbia and the states, while she has forests of her own rotting within forty miles of some of her railways. Placing these facts before them we can ask for a capital to lay down our transport schemes, and some saw-mills at central points. We can then drive all foreign lumber off the market, can undersell them, to Australia Mesopotomia, and Egypt, can place our valuable woods in the London and even New York markets at a very satisfactory profit. By having our materials cut in saw mills, we can afford to put in modern seasoning plants using steam from the saw-mill boilers. In modern timber treating plants, we can chemically treat our timber and sleepers to preserve them against white ants and decay. This will enable us to use our less valuable woods for construction and sleepers and sell the more valuable species at high prices in Indian and foreign markets In return a very large increase in revenue will be available in a few years and the country as a whole will benefit in many ways. All these mean opportunities for India's young men, expansion of her trade, and increase in her Industries. Thus by educating public opinion and trying to work up India's natural resources we will surely be devoting ourselves to the true progress of India and in these days of much platform speaking and N. C. O it is a great consolation to know that by a forest career, we will be helping our country more than we could do in most other careers.

From times immemorial our community are agriculturists and since by occupation and the natural features of our district, we are made strong, sturdy and enduring, and as forestry is the only vocation which requires these rare gifts more than any other, it is the profession best suited to us. Besides some of my near relatives are in the agricultural department and one is learning medicine. I being fond of a more adventurous and out-door work, chose forestry as my optional, so to say as being the most congenial to my tastes.

Modern education as is imparted in the arts colleges at present is far from being satisfactory, in that it is too narrow and not sufficiently interesting. We cannot all care about grammer and even about mathematics. Those who love natural science, for instance, find little at school which appeals to them, and even those with literary tastes are surfeited by the monotony of classics, so that few keep up their studies after leaving schools— they might have learnt much, but they have too often lost what is far more important, the wish to learn. Besides they have the false dignity in thinking that labour is 'infradig' for a college man. But we in the Forest College are taught about the dignity of labour, and our education is an all-round technical one, so that we know something of everything and everything of something, which in my opinion is an ideal education. A forest ranger at present besides specialising sylviculture, botany, and utilization, is also a forest engineer, a policeman, a forest merchant, a forest lawyer, and a surveyer and a draftsman Over and above this he is given a course of instruction in First aid, some training in drill and gymnastics, and has played some hockey, foot-ball, cricket and tennis.

The aesthetic advantages of a forest are inestimable. "How much our lives owe to the beauty of flowers" says Ruskin "they seem intended for the solace of ordinary humanity," The peaks rising one above the other, their slopes clothed with trees of all shapes and sizes, their foliage and flowers presenting a diversity of colours is most pleasing to the eye. The little rills dashing with headlong speed down the steep hill slopes glimmering in the morning sunshine present a beautiful sight.

For concentration of mind solitude becomes a necessity. Byron says :—

There is a pleasure in the pathless woods
There is a rapture in the lonely shore
There is a society where none intrudes
……………………………………………
If society teaches us how to live
It is solitude that should teach us how to die.

By day or by night summer or winter beneath trees, the heart feels nearer to that depth of life which the far sky means. The rest of spirit found only in beauty, ideal and pure, comes there because the distance seems to be within touch of thought.

"Health is Wealth', and to keep the body in a healthy condition should be the aim of everyman. A forester is always enjoying the pure ambrosial atmosphere of the forest and his daily walk in the forest not only makes him healthy but also strong.

The open air is not a cure for the body only, but for the mind also.

Variety is the spice of life A ranger's work is not a monotonous one, but it is a combination of the work of the chair and of the field. After a few days of office work, especially towards the close of the month, he goes out camping. He looks to a sylvicultural operation one day, does a little of engineering, the next day, and inspects a timber depot on another day. Sometimes he attends courts and conducts forest cases, while at other times he may have to conduct auction sales of coupes, or of timber. Thus his work is a varied one and is not worried by the dull monotony which characterises most other occupations

The forest department has yet another great attraction to many young men, and that is shikar. Many of the forests abound in game and the forest officers have ample opportunities of collecting many excellent and rare trophies.

In times of trouble or anxiety the lover of trees will feel with Tennyson that:—

> " The woods were filled so full of song.
> There seemed no room for sense of wrong."

So far I have been dwelling on the bright sides of the department. I admit that the forest department as every other department has a few trials. Some characterise it as a restless and rather adventurous existence But as it is only meant for those of good and healthy constitution, many of the so called difficulties can be disregarded One serious draw-back which however we have to own is malaria But all ranges are not malarial and if proper care is taken this fever can be minimised to a great extent.

I cannot affirm here with any experience that the ideals set forth here are realised during one's service in the department, for experiance of the department I have none. My short practical training under a kind D. F. O. and a very practical range officer has been a pleasant experience for me. My College life has been another pleasant chapter to add to my short experience of the forest department.

In conclusion I have to state that for the several advantages that forestry has over many other professions, I have selected it. Forestry is specially suited to our community and more particulary it appeals to me as it is mostly an out-door life. Then the Forest College gives an all round excellent education useful in every walk of life. Besides, forests afford ample opportunities for shikar. For these reasons and others enumerated above, and the fact that India has a great forest future I maintain that perhaps with the exception of the medical, forestry stands second to no other profession in India.

Our doubts are traitors,
And make us lose the good we oft might win,
By fearing to attempt."

The Village-war Lump Sum Grazing Revenue System

In *Sriharikota* Reserved Forest (NelloreDistrict) the cattle belonging to the local villagers are of a semi-wild nature Every year during the grazing season the Forest subordinates find it very difficult to collect the grazing revenue due on account of these cattle, because when the cattle see any persons other than their owners, they become furious and run away, so that the subordinates are unable to impound them. Their owners taking advantage of this boldly evade the payment of grazing fees.

These animals break through the fences of felled coupes, enter, and destroy the coppice shoots either by browsing or trampling down. Annually, during the grazing season, the Forest Department used to, until quite recently, engage men, who patrolled the Reserve, and, with the aid of their dogs, rounded up and caught any trespassing cattle and impounded them. The dogs caught the cattle by their ears legs or tails and then the men secured them, with ropes and drove them to the pound. This system of rounding up the cattle proved very cruel as the animals bled profusely, and sometimes died of the dog bites. It was therefore discontinued.

However in order to collect the full grazing revenue and solve the semi-wild cattle difficulty, other methods were adopted, but proved ineffective. In one instance it was proposed to publicly warn the villagers to catch their animals and remove them from the Reserve within a fixed time, after which they (the cattle) would be liable to be shot by the Department. This was not approved, because Hindus worship cows and the proposed procedure would breed discontent.

Another proposal (which would also, to a considerable extent eliminate the smuggling of Minor Forest Produce, by which the Department was losing more than Rs. 5,000 annually) was to acquire the villages (enclosures) lying within the Reserve and provide the villagers with new village sites and lands for cultivation in some other healthier taluk of the Nellore District, the Sriharikota Taluk being notoriously unhealthy, where virulent types of fever and the worst form of elephantiasis are prevalent. The villagers utterly refused to leave their native homes, and this proposal also failed.

It was then proposed to strengthen the fencing round coupes and barbed wire was tried but proved too costly. Endeavours were also made to induce the people to accept the "Kancha System" of grazing under which Reserves are leased out at a fixed rate per acre as is usually done in the District.

The people refused, because the Sriharikota Reserve has a vast area of 25,000 acres, and the number of cattle in the villages contained in it is limited. Calculating at Re. 0—1—0 per acre, the grazing revenue of this Reserve would amount to more than Rs. 6000/- yearly; whereas when collected at one rupee per cow unit the grazing revenue is about Rs. 1000—0—0 only. It is, therefore, quite clear why the villagers in this Reserve do not agree to the "Kancha System".

Eventually during the current year (1922–23) a modified "village-war" system known as "The Lump Sum Grazing Revenue System" was introduced. Under this system the villagers pay a lump sum at the beginning of the grazing season, the lump sum being fixed by the Department for each village separately. Cattle census figures are obtained from the Revenue Department and the lump sum amount fixed for each village is calculated, so as to more or less agree with the average annual grazing revenue of previous years. The people of each village nominate one or two headmen, who on behalf of the villages they represent, execute an agreement with the Department, undertaking to pay promptly, at the beginning of each grazing season, the lump sum amount fixed by the Department and to abide by the following Conditions.

(1) Goats are strictly prohibited.

(2) The people should pay particular attention that their cattle do not enter the coupes closed to grazing, and that they, (the villagers), should take an interest in the proper maintenance of the fences round felled areas

(3) After a lapse of three years a census of the cattle will again be taken and the amount already fixed will be revised.

This system has been introduced in seven different villages and the villagers think that it is a great improvement on any previous system, and remit the "Lump sum" revenue due promptly through their headmen. This relieves the Department of considerable worry, as the collection of revenue from individual cattle owners was always, a tedious and troublesome business

The advantages of this system, briefly speaking, are ;

(1) The full grazing revenue is promptly collected in a lump sum, with no resultant ill-feeling on the part of the villagers.

(2) Extra work in the Range and District offices, maintenance of accounts by permit-issuing officers, possibilities of embezzlement by them, and the range subordinates, and the payment of commissions to permit issuing offices are all avoided

(3) The question of illicit grazing automatically disappears.

(4) The people are bound by the terms of the agreement to take a certain amount of interest in forest conservancy especially in the protection of coupes and thus the prevalent anti-Forest feeling may, in the course of time, disappear.

This system may, with advantage be applied to the Reserves where the application of the "Kancha" system of the Nellore District is not practicable or is in any way unsatisfactory.

ALAGIRISAMI NAIDU,
Range Officer.
(Sriharikota Range, Nellore District)

The " Wattle & Daub " method of house-Building in Ceylon.

Among the many different methods of house-building, from the construction of the crudest hut to the erection of a costly & elaborate building, practised in Ceylon, the " Wattle and Daub " method is one of the most useful, as it combines cheapness with a comparatively long durability and good appearance.

The rapidity with which buildings are constructed under this method is also a point in its favour.

I shall now endeavour to describe this " Wattle and Daub " method. To start with, it is adopted by the Public Works, the Irrigation and the Forest Department, as, as already pointed out, the method is economical, both in original outlay and in the cost of maintenance, and provides buildings of a semi-permanent type, and of an appearence, very similar to that of buildings constructed on more elaborate lines.

To proceed with the actual construction :—

A level plot of land, is chosen on well drained soil, with due regard to communications and the proximity of a perennial water supply, and is cleared of all growth and foreign matter. The outlines of the proposed building are then pegged out, care being taken that the building does not face either monsoon.

Straight and sound posts of "Cassia Fistula" or some other suitable species are chosen, roughly squared with the adze and planted firmly in the ground in holes (2½ to 3 ft. deep or more according to size of the proposed building) dug for the purpose at the corners and along the lines to be occupied by the walls, at intervals of 6 ft. or so. In selecting these posts, care should be taken that they are of a very durable nature, of uniform shape and size and strong enough to bear the weight of the whole superstructure of the building and between the posts originally planted.

Door and window frames are placed in the positions they will eventually occupy and are held in position by staves, to which the frames are lashed. These staves are in turn lashed to the posts planted originally, and must be so arranged that they will eventually be covered with the mud and plaster.

Split pieces of bamboo, or wattles of round timber and then fastened horizontolly to the posts both inside and outside the building at intervals of 6″ to 9″.

Good stiff earth, containing a large percentage, about 25—30 per cent of clay, and of fine texture is cut and removed to the site. Care must be taken to get earth free of all organic matter. All stones and other hard substances are then removed, water added in small quantities and the earth well puddled until it acquires a plastic consistency.

The puddled earth is then left on the ground for some hours. In fairly large buildings these posts are usually set on blocks of stone sunk into the ground to present a larger bearing surface to the foundation bed.

It will also be advantageous to tar the ends of the posts before they are put into the ground

The roof of the building is then built on these posts, and if the building is to be tiled the tiles are also placed and fixed in position.

The reason for this procedure is that the heavy monsoon rains of the Island would otherwise interfere with the efforts of the workmen and would considerably delay the completion of the building. It is also on account of this heavy rain that houses in Ceylon are built with low eaves and wide verandahs.

The whole superstructure less the walls being completed the work of building the walls begins.

An excavation with a breadth equal to the thickness of the required wall and about one foot or so deep is dug along the length and breadth in order that it may ferment and attain a condition which would result in immediate setting directly it is plastered on the wall.

This mud-mortar is then taken up by hand and is thrown violently into the spaces between the posts aud the pieces of split bamboo running horizontally so as to occupy the entire space enclosed. By this process the wall is gradually built up in successive layers and lengths.

When the whole structive is complete, well set and dry the walls are very evenly plastered over with mud or lime mortar The latter is always used in the case of Government buildings to improve their appearence.

The plaster, when half set, is polished with a smooth piece of wood, called a float, in order to give the walls a smooth glossy surface.

The floor of the building is then filled with gravel to a depth of about 8″—12″, and rammed with wooden or iron rammers until quite hard and well consolidated. It is then either tiled, or plastered and cement-washed.

The walls are then white-washed and the minor details of pointing, etc., seen to The building is then ready for use.

I need not impress on my readers the advantages of this method of building.

It is inexpensive both to construct and to maintain, and is at the same time neat and habitable.

For such buildings as outhouses, cooly lines, etc., where sufficient funds for the construction of Pucca buildings are not forthcoming the "wattle and daub" method may with advantage be adopted.

K. P. Rajalingam,
Junior Student.

The Prickly Pear (Nagathali) and Lantana

The Prickly Pear, (*Opuntia Dillenii*) is classified under "cladodes" which are stems coloured green (with or without inconspicuous leaves) which more or less resemble leaves and perform the functions of a leaf The Lantana is a very common armed shrub of the Verbenaceae Natural order.

Both these plants were originally brought to India from America as fancy garden plants. Now, they. once perhaps valuable garden plants, are universally considered to be among the most obnoxious of our forest pests. Extensive areas of both forest and cultivable lands have been exclusively occupied by them and it is difficult to say which of the two is the most aggressive. The scrub jungle and grass lands in the neighbourhood of villages ("Vilage Porambokes") are very often reduced to mere wastes owing to their complete occupation by Prickly Pear; while Lantana appears to concentrate its efforts in remoter and perhaps moister localities.

In *Pennagaram* Reserve of Dharmapuri Range, almost the entire area of the Reserve is covered with Prickly Pear In many places footpaths have been completely overgrown and public thoroughfares are getting narrower and narrower every year. Annually special coolies are engaged on monthly pay to keep such routes clear and comparatively large sums of money are spent. Similarly in the Wynaad, and other Lantana abounding places, considerale expenditure is incurred annually in endeavouring, by uprooting, to completely eradicate the Lantana pest. In the *Denkanikota* Range of the North Salem District, until 1920, there existed a special staff consisting of a Deputy Ranger and two Forest Guards, for this purpose only and thousands of Rupees were spent with no effect and at present I can, for certain, say, that there is practically no difference between the eradicated and uneradicated places.

Village communities, have, from time to time, attempted to remove the Prickly Pear entirely, but it has not been possible to do so, nor will it be possible unless all ryots join together and work their hardest. I believe, in one of the Native States, probably Mysore, the Government has offered a reward of Rs 10,000 to any person or persons, who find a remedy to eradicate this pest. It is also believed, that some expert is investigating the question and is trying to find some other plant, of a gregarious type, which, when introduced, will suppress and completely exterminate the Prickly Pear. But in this, as in all other such problems, we are confronted with the difficulty of finding a plant which will prove a remedy only and which will not eventually turn out to be a pest itself.

Of the two pests, Prickly Pear can, I think, be considered as the lesser of the two evils, at any rate from a Forester's point of view. Localities infested with Lantana take fire every year on account of the highly inflammable nature of the shrub in the dry weather, and extensive tracts of forests containing numerous seedlings of valuable timber species are devastated annually. Secondly the Prickly Pear is useful, when green, as food for cattle and when decomposed yields a valuable manure. It is also used as a mordant in white or colour washes.

Since no use has yet been found for Lantana, I shall confine the remainder of this essay to a short account of the various uses of Prickly Pear.

In Coimbatore District, and probably many other districts also Prickly pear manure is extensively used in the cultivation of dry crops, such as Cholam, Ragi and Cambu It is also used in the cultivation of chillies, tobacco, plantains etc.

In raising forest nurseries, a certain amount of manure is useful, if not essential; and may easily be obtained from the decomposed remains of prickly pear clearings in the vicinity. The Madras Forest College Estate Nursery may be mentioned as an instance in this connection.

The origin of prickly pear as a leaf manure appears to be founded on the following short anecdote:—

A ryot removed the litter which he found accumulated under prickly pear and used it as manure in his fields and in due course other ryots tried the same experiment, until eventually everybody in the locality recognised the virtue of prickly pear manure.

Now, when a ryot finds the prickly pear growing by the side of his field or encroaching on his lands, he clears it and converts it into manure. This practice is not at present wide spread, but in places where it is customary, the earth near prickly pear is sold at the rate of 2 to 4 annas per cartload (The rate, I understand, is rising on account of the general increase in the cost of labour). This earth is naturally valuable, as it contains a large proportion of the decomposed remains of prickly pear, which yields 15 per cent of organic matter. By utilizing prickly pear as manure the ryots derive two advantages (1) they get rid of the pest, or prevent it from encroaching upon their field or keep it under control in their grass land areas and (2) they obtain good manure for enriching the soil.

Now as regards the actual preparation of the manure, three methods are commonly practised.

(1) Trenches of 2½ feet to 3 feet depth and about 6 feet broad are dug to any length (usually 20 to 30 feet), at a time occuring between the two monsoons, immediately the agricultural works, (that is, sowings and plantings), are over, and the ryots instead of idling away their time, clear the prickly pear bushes and fill them into the trenches, which are then covered up with the earth originally removed from them. After a time, the earth sinks on account of the decay of the vegetable matter, when the hollows are again filled up with the earth dug up from under the bushes. The first layer of earth is ordinary earth and lies in direct contact with the prickly pear. The second layer is earth already enriched by prickly pear litter. The whole is left over for a year. If there is sufficient rain, the decay of the prickly pear will be complete in one year and the manure may be used for the following years' cultivation. If there is insufficient rain

the thorns will still remain undecayed and the pits should be allowed to remain for another year. In opening the pits the actual decomposed remains of the prickly pear become unavoidably mixed with the two layers of covering earth and the whole is used as manure.

(2) In places where there is scanty rainfall, the ryots, in their leisure time, up root the bushes, collect them into large heaps and leave them for some days in the hot sun. They then cover them with dry twigs, leaves, etc., and set fire to the lot. When the thorns are partially burnt, the heaps are covered over with the earth obtained from under the bushes and are left to rot for a period varying from 3 to 5 years. After this period, decay is complete and the remains of the originally up rooted prickly pear, which is again unavoidably mixed with the covering earth is available in a fit state for use as manure.

(3) The last method, though the easiest, is a little costly. The bushes are cut and ground inmortar mills (chunnam grinders) On account of the high percentage of water in prickly pear (about 85 Percent) the whole becomes a pulp. The thorns are also ground to some extent. The pulp is then removed to pits (the excavation of which has already been described under the first method) and covered with earth obtained from below the bushes. By this process the pulp decomposes in about 6 months and the manure is fit to be used in about 8 months' time. The reason why earth abtained from below existing bushes is used is, that, it contains a larger proportion of

organic matter than is present in earth excavated in the open, and therefore adds to the value of the manure, with which it eventually becomes mixed when the pits are uncovered.

As already pointed out, the prickly pear is used as cattle food, but before it is available as such, it is treated in the following manner. The branches are cut into large pieces and the thorns removed either by roasting the pieces over a black-smith's furnace, or by removing them with the aid of a pair of tongs; (the latter method is very slow and tedious). The pieces, when cleaned of thorns, are cut into smaller pieces and may then be given to cattle Usually cotton seed is mixed with the prickly pear to enrich the food and make it sweeter. (By itself prickly pear does not form a nourishing food). This practice is common in some parts of the Bellary, Anantapore and Coimbatore Districts and in certain other places of the Mysore State.

Regarding its use as a mordant in white or colour wash, the following is a short description of its preparation. An ordinary pot is filled with prickly pear cut into small pieces The pot is then filled with water and boiled for about 3 to 4 hours, being stirred frequently. It is then allowed to cool, and after cooling, the liquid is filtered, and the filtrate is added to the white or colour wash in the proportion of 1 to 150. In walls washed with this mixture, the color is not only fast and longstanding but is also not easily brushed off and has a glossy surface.

Lastly in many localities devoid of other fruit trees, the fruit of the prickly pear forms the chief food of monkeys and other animals; jungle tribes, or even the poorer classes, live upon these fruits during certain seasons of the year. Good fruits may on hot days be eaten to quench the thirst

The fruit of prickly pear is also useful as a mucilage, but on this point I need not comment further as it has already been dealt with elsewhere in this number by M R Ry. E. K. Krishnan Avl.

S. Rengaswami Iyengar,
Junior Student.

ATHLETICS.

Minutes of the Annual General Meeting of the Madras Forest College Athletic Club.

A meeting of the Madras Forest College Athletic Club was held on the 9th August 1922 at 11-45 A. M. in the Principal's Office Room when the following were present:—

Mr. C. C. Wilson	*(President.)*
Mr. G. C. Robinson	*(Vice President)*
Mr. W. C. Hart Mr. E. K. Krishnan Mr. A. R. Brand	*(Instructors)*

Students

S. Hadi Husain.
N S Ayyanna
P. A Venkataraman.
S Sankaran.
P. T. Jayakody.
B H. Ananthathirtha Rao.
S Doraraja

The following is a resume of the proceedings:—

1. Election of Secretary.

Student Doraraja was elected as Secretary.

2. Accounts 1921-1922.

The apparently heavy expenditure on sports day was discussed and it was decided that the expenditure was not excessive; and that similar arrangaments should be made for the comming sports day.

3. Accounts 1922-1923.

The total anticipated receipts was estimated at Rs. 825 exclusive of the Government donation of Rs. 400. The total anticipated expenditure worked out to Rs. 1000. In order to make up the deficite it was proposed and carried:—

(1) that students whose pay was Rs. 50 and over per mensem should pay an annual subscription of Rs. 6, instead of Rs. 5, recoverable in monthly instalments of 8 annas.

(2) that such of the private students as can show that they are unable to pay the enhanced rate may continue to pay at the rate of Rs. 5 per annum.

(3) that the members of the staff should subscribe one full day's pay instead of ¾ of a day's pay as hitherto.

4. Revision.

A special committee was appointed to investigate and revise the Rules of the Athletic Club, and the rules governing the award of the Pentland Shield, and to frame rules for the "Fisher Cup" Tennis Tournament.

5. Appointments.

The following appoinments of Captains for the various Games were made.

(1) Hockey— Hadi Hussain,
(2) Tennis — Sankaran.
(3) Foot-ball—Anilkumar Bose
(4) Cricket—Ayyanna.

6. Marathon Race.

The question of the place where, and time at which, the Marathon Race should be held was left to the Sports Committee to decide.

8. General Duties.

Mr. Brand was requested and kindly consented to assist the Vice-President of the Athletic Club in his general duties

9. Prizes for the coming sports.

The question of presentation of prizes for the sports was discussed and Mr Robinson promised to do his best to collect such donations from the staff as they were generous enough to give.

The meeting then adjourned.

(Sd.) S. DORARAJA,
Secretary Athletic Club,
Madras Forest College.

The Madras Forest College

Athletic Sports, 1922

The annual atheletic sports of the Madras Forest College, were held on Saturday the 21st October on the College Athletic ground. Messrs. C. E. C. Fischer, F. R Parnell, C G. Tottenham, C. S. Ratnasabapathi Mudaliar, M R. Ramaswamy Sivan, Captain W. G Dyson, F. D. Ardagh and J. W K. Wernham very kindly acted as

Judges. Messrs H. F. A Wood and C. C. Wilson were refrees ; Rev. Father Jambeau and Mr. E K Krishnan the time keepers ; Messrs. W. C. Hart and A. R. Brand the starters & Mr G. C Robinson the recorder.

The ground was tastefully decorated and the tents bedecked with flags. The proceedings began punctually at 3 p. m. with the first event on the programme – the 100 yards flat race. The weather was exceptionally fine, though the rain of the previous evening had slightly affected the ground. In response to our invitation a large number of European and Indian ladies and gentlemen together with a large gathering of students of the Agricultural College, and other local institutions were present. The function was a great success & this was in no small measure due to the indefatigable efforts of the Vice-President, Mr. G. C. Robinson, whose work in this direction was not confined to this day and the one before only, but extended over some weeks previous and was in addition to his many other pressing duties.

The Principal, staff, and students were at home to the guests. Mrs Wilson very kindly under-took the entertainment of the European guests which she did very successfully after a great deal of labour and patience. Mr, E. K. Krishnan assisted by Mr, K A. Bhandary and a few student volunteers entertained the Indian ladies & gentlemen, who numbered over two hundred. Needless to say, their task, though an arduous one, was also very successfully accomplished.

The Athletic display was as good as that of any previous year and in one event even better, student Madavan Nair beating the College record for the Mile Race, his time being 5′-28 2/5″ against 5′-29 4/9″ created by M. B Ayanna last year. Madavan Nair was awarded the Special Prize for breaking a College record, very kindly given by Mr. H F. A Wood, Conservator of Forests Among the most exciting and interesting events may be mentioned the obstacle race and the sack scrimmage.

It was rather disappointing to see only three old students of the College (one being Mr. K A. Bhandary, an honours student of last year and attached to the College) present this year to compete for the old students' race. However this was a bit better than the previous year, when only one was present. with the result that the race could not be run. We hope that there will be a much larger attendance of old students in future years at this, one of the most important functions in our College year.

The first prize for all major events was a cup, and the second a silver medal engraved with the name of the event.

We offer our hearty congratulations to P. Madavan Nair, and Bushanam, the winners of the Richmond Cup, both having scored 12 points each. Unfortunately no Athletic Colours were awarded this year, as the award is only made in cases where the winner scores at least thirteen points, but it is hoped that the President and Vice-President of the Athletic Club will be pleased to reconsider the minimum number of points governing the award of "Athletic Colours" and also decide that the winning of the "Richmond Cup" should in itself justify the award of athletic colours.

The competitors who were in the running for the Richmond Cup and their Athletic Colours and the marks gained by each are as follows:—

(5, 2 & 1 marks respectively are allotted for the 1st, 2nd & 3rd places in each of the events noted below Those who gain 13 points and above are entitled to Athletic Colours. The highest aggregate wins the Richmond Cup.)

Name of student	100 yards	¼ mile.	½ mile	1 mile.	120 yards hurdle	Long Jump.	High Jump.	Throwing the Cricket ball.	Total.
1 Madavan Nair		2	5	5					12
2 Bushanam.	5	1			5	1			12
3 Rahim tulla Khan.	2	5			2				9

It will be seen from this that even the winners of the Richmond Cup, are below the standard (viz 13 points) demanded by the rules of the club even though one man broke a previous year's record. This comparatively low aggregate gained by the winners of the Richmond Cup is obviously due to the much keener competition than has been experi, enced in past years.

The results of the various events are as follow:—

A- competed for on the "Semi-final" day:-

I. Throwing the cricket ball.

1st K Ganapathy	(72 yds. 1ft. 7 in.)
2nd Mumtaz Hussain.	
3rd A Jayasundra.	

B. Run off on the day of the sports:-

I. 100 yards Flat race.

1st T R. Bushanum	(11 4/5 sec.)
2nd Rahimtulla Kahn.	
3rd Hadi Hussain.	

II. ½ mile Flat race.

1st Madava Nair	(2 min. 24 1/5 sec).
2nd Divulvewa.	
3rd K. S. Timmayya.	

III. 120 yards Servants Handicap race.

1st Momad.
2nd Chinnasawmy.
3rd Baba.

IV. 120 yards Hurdle race.
1st T. R. Bushanam (20 2/5 sec)
2nd M. Rahimtulla Khan.
3rd A. Jayasundara.

V. Invitation ½ mile race.
1st Srinivasan (L. M. S. High School).
(2 min. 20 1/5 sec.)
2nd Small. (Stanes School)

VI. High Jump.
1st Bose. (4 ft. 8½ in.)
2nd Appadurai.

VII. ¼ mile Flat race.
1st M. Rahimtulla Khan. (61 3/5 sec.)
2nd P Madava Nair.
3rd T. R. Bushanam.

VIII. Long jump.
1st Mumtaz Hussain. (16 ft 11in)
2nd Hadi Hussain.
3rd T. R Bushanam.

IX. 100 yards Flat race for past students.
1st Appiah. (13 sec.)
2nd Bhandary.

X. One mile Flat race.

1st P. Madava Nair. (5min. 28 2/5 sec)
2nd Patras Kandir.
3rd Mumtaz Hussain.

XI. Visitors' Children's race.

1st Walter Hart.
2nd Gladys Dee.

XII. Obstacle race.

1st T. R. Bushanam.
2nd Amos Dempta.

XIII. Relay race. Winning Team:—
Bihar and Orrisa, Hyderabad and Central India students.

XIV. Sack Scrimmage Winning Team:—

1. Vedanayagam.
2. Amos Dempta.
3. Jayakody.
4. Rajalingam.
5. Divulwewa.

After the last event Mr. G. C. Robinson, the Vice-President of the Athletic Club made the following speech :-

"Ladies & gentlemen, before I ask Mrs. Parnell to give away the prizes, I would request your indulgence for a few minutes as there are one or two points on which I wish to touch.

"I must offer our heartiest thanks to those who have kindly officiated to-day in various capacities Our thanks are also due to the Instructors of the College and others who have contributed towards the prizes to-day, and Messrs. Barton & Sons for supplying the cups and medals at special rates.

"The performance to-day was very good. The prizes are more or less equally divided among both the divisions The Richmond Cup for the largest number of marks has been won by two students (Madava Nair and Bhushanam) this year. We congratulate them heartily on their success We have further to congratulate Madava Nair on his success in breaking the College record in the mile race and thus winning the prize very generously offered by Mr. H. F. A Wood, Conservator of Forests for breaking a College record

"It is gratifying to see that 3 old students have turned up this year for the old students' race as against one in the previous year. We hope that more old students will attend this function in the next and future years.

"I will not keep you any longer, but will ask Mrs. Parnell to to be so good as to distribute the prizes so arduously won."

The prizes were then very kindly presented by Mrs. Parnell. The Medals for the "Hockey Sixes" and the Father Rhondy Cricket Shield' won for the first time by the Forest College. were also given away, the latter at the request of the Secretary of the Local Athletic Associatian.

[The "Hockey Sixes" is a tournament completed for by teams from both divisions. The matches were played mostly in camp, and the final was played in the head quarters. The Principal has very kindly given medals to the winners. This year winners are Rahim's team composed of Rahim, Bushanam, Gupta, Meta, Sukkal and Divulvewa, of the Junior Division.

After fhe distribution of prizes, three hearty cheers were in turn given for Mrs. Parnell, Mr. G C Robinson and Mr. H. F. A. Wood, and every body dispersed having spent a most enjoyable evening.

S. Doraraja,

Athletic Secretary,

M. F. C.

Cricket.

The Madras Forest College Cricket Eleven played several matches against The Agricultural College, Stanes' High School, The United Club, and the Anamalai Planters In all these matches the college won by a comfortable margin. The Team competed for the Y. M. C A Cricket Tournament and won The "Father Rhondy shield".

The following extract from " The Hindu " gives an account of the Final match in the tournament :—

"*Cricket at Coimbatore*"

Competition for Father Rhondy's shield

MADRAS FOREST COLLEGE. *Vs* **MADRAS AGRICULTURAL COLLEGE.**

The above Fixture came off on Saturday the 2nd September on the Agricultural College ground. The Forest College winning the toss, elected to bat & sent in their opening batsmen. The home team started well by capturing the first wicket for no run. But with Hadi Husain and Mr. E K. Krishnan, together, matters took a different turn. Hadi was bowled after scoring a useful 29. Mr. Krishnan continued batting merrily and in this respect was ably seconded by Mr. Bhandary who although not batting very long, played a bright innings, and scored off a number of well timed strokes eventually being caught well out in the deep Field. Then Jayasundara went on to complete the century contributing 33. Ill luck, however, seemed to pursue the Forest team as they lost three of their best batsmen Mr C. C. Wilson, Mr. G. C Robinson and Ayyanna the Captain in quick succession. They made 127 runs in the first innings.

The Agricultural team fared worse at the hands of their opponents' bowlers; the whole side was able to muster up 95 runs.

In the second innings of the Forest College, Mr. Krishnan and Mr. Bhandary played faultless cricket hitting all round the wicket The scoreboard recorded the tens every 3 or 4 minutes Mr Bhandary's 43 (not out) included 1 sixes & 3 fours and Mr. Krishnan's 48 included 5 fours The Forest team declared their innings closed at 105 runs for the loss of 4 wickets

With 40 minutes to play the home team went in a second time, and soon lost 2 wickets Cricket was very fast and in the end The Forest team had taken 5 wickets for 71 runs when stumps were drawn. The Match thus resulted in a win for the Madras Forest College by a innings and 66 runs."

The following students were awarded "Colorus" for Cricket"

(1) Jayasundara.
(2) Jayakody.
(3) Ayyanna.
(4) Hadi Hussain.
(5) Sankaran.

Hockey.

Since the arrival of the present Junior Division last August, the College Hockey Team has played 6 matches, of which 5 were won and 1 lost. In October the College Team entered for the Stanes

Hockey Tournament. The number of entries was six, which is unusually large In the first two rounds of the tournament the College defeated the the Reserve Police and the Madras Agricultural College; and met the Auxiliary Force Team in the final —where unfortunately we were beaten by 5 goals to 4. It was an excellant match and there is no doubt that the Auxiliary Force had a very strong team. However let us hope that next year we will have better luck.

No Hockey colours have been awarded this year.

Football.

Our Football Team this year is not as strong as usual, and more time has been devoted to Cricket and hockey. Only two outside matches were played during the season, and we were defeated in both. Student Anil Kumar Bose of the Senior Division was awarded his colours for Football.

A. R. B.

Prickly Pear Mucilage.

It may not be known to many people that Prickly Pear produces an excellent mucilage which is very valuable as an adhesive. Take the developing fruit *just after* the yellow petals have been shed (I refer to *opuntia Dillenii*) the top of fruit will then be greenish white in colour. If it is reddish or yellowish the fruit has been allowed to be come too mature and no mucilage will appear. Take a thin slice off the top, and gently press the fruit. From the ducts of the fruit, whitish semi-transparent mucilage will be seen to exude. Collect this in a spoon or a tube and try it for mounting photographs, or for other purpose where gum would be used. It is an excellent adhesive and the fact that it does not discolour photographic mounts, or paper is a point in its favour.

I once used this mucilage to stick a rubber patch on a unctured bicycle tube. The patch stuck fast on the tube all the way Pback to my camp some six miles distant.

The mucilage however, does not keep. It becomes mouldy and dry if kept longer than a week. It loses its adhesive property too in that time.

E. K. Krishnan, E. A. C.

MISCELLANEA.

THE MADRAS FOREST RANGERS' ASSOCIATION.

PROGRAMME

of the

3rd Anual Conference of the Association

to be held at Madras between the 27th and 30th DECEMBER 1922.

27th. Rally and Business Committee Meeting.

28th. 8 A. M:— Welcome Address by Mr. A. Sithapathi Aiyar, B. A., (Chairman of the Reception Committee).

2 P M. to 4 P.M:- Discussion of the subjects to be passed at the General Conference

29th. 8 A.M. to 11 A.M:- Executive Committee Meeting.

2 P.M. to 6 P.M:- (1) Opening speech by Mr. C. D. Parthasarathi Chetty.

(2) Annual report by the Secretary.

(3) Presidential address.

(4) Subjects:-(*a*) "Time scale and improvement of pay" by, Mr T. D. Ponniah,

(*b*) "Forest Ranger in the scale" by Mr. S. G. Venkataramanan.

(*c*) "Our pernicious habits and emancipation" by Mr. G. N. Subba Rao Pantalu, B. A.

(*d*) "A paper on Forest Re-generation" by, Mr. T. G. Sankaran Nair, B.A.

30th. (5) Amendment to the rules of the Association by Mr. M. Muthusami Aiyar.

(6) Re-affirmation of the resolutions passed in the 1st Annual Conference.

(7) "Difficulties of Range Administration" by, Mr. P. A. Krishnaswami Mudaliar.

(8) "A paper on Spike" by Mr. Nageswara Iyer.

(9) "Some practical methods of retrenchment in the Forest Department" by, Mr. T. M. Krishnamachari to be supplemented by Mr. T. D. Ponniah.

(10) Concluding speech by the President.

(11) Vote of thanks by Mr. C. P. Garudachalam Mudaliar.

T. D. PONNIAH,

Secretary.

P. S.-Those members who are willing to speak on the resolutions passed in the 1st Annual Conference may communicate to the Secretary.

T. D. P.

THE MADRAS FOREST RANGERS' ASSOCIATION.

PROCEEDINGS.

of the

MEETING OF THE EXECUTIVE COMMITTEE HELD AT SALEM

on the 19th and 20th August 1922.

RESOLUTIONS:—

I. Resolved that a deputation of the following members of the Association headed by Rao Bahadur M. R. Ry. V. Alwar Chetty Garu, Retired Extra Deputy Conservator of Forests, do wait on the Honourable Member of the Government in charge of Forest Port folio to represent the cause in connection with our recent memorial in continuation of the deputation, before the Chief Conservator of Forests on 15-7-1922 at Salem:—

(1) M. R. Ry. Rao Bahadur V. Alwar Chetty Garu, B. A., Retired Extra Deputy Conservator of Forests to be the spokesman of the deputation.

(2) Mr. J. D. David ... ... First Circle.

(3) „ D. E Lewin ... ... Do.

(4) „ Syed Ibrahim Albiz ... ... Second Cirle.

(5) „ G. Rama Rau ... ... Do.

(6) „ T. M. Doraisami Pillai ... .. Third Circle.

(7)	„	A. Sitha Pillai	Do.
(8)	„	M. Muthusami Aiyar	Fourth Circle
(9)	„	S. G. Venkatramanan	Do.
(10)	„	T. D. Pooniah (Secretary)	Do.
(11)	„	A. B. Fenn	Fifth Circle.
(12)	„	C. P. Garudacham Mudaliar.	Do.
(13)	„	C. Karunakara Menon	Sixth Circle, and
(14)	„	P. S. Nair	Do.

II. Resolved that the Secretary be authorised to communicate to the Honourable Member and take all other steps necessary in connection therewith.

III. Resolved that a single Railway fare be paid to and fro. to the members of the deputation from the funds of the Association.

IV. Resolved that Messrs. G. N. Subba Rau Pantaln, B. A , and C. P. Garudachalam Mudaliar do wait on the Honourable Member of the Government of India to represent our cause.

V. Resolved that the 3rd Annual Conference of the Association be held at Madras between the 27th and 30th December 1922.

VI. Resolved that steps be taken to approach Government to recognise the Association as contemplated in G. O. No. 772 dated 9-11-1921.

VII. Resolved that Mr. P. B. Syed Yahia Sahib, Range Officer, Salem Range, be nominated Treasurer of the Forest Rangers' Association and vested with powers to open accounts with the Imperial Bank of India, Salem Branch, In the name of the Forest Rangers' Association to be operated on by the Treasurer for the time being, and that the accounts that stand in the name of Mr. M. Muthusami Aiyar, Forest Range Officer, President and Treasurer of the Association be transferred to the name of the said Association.

VIII. Resolved that the accounts of the Association up to 20-8-22 be audited by Messrs. S. Chidambara Aiyar, S. G. Venkatramana Aiyar, C. P. Garudachalam Mudaliar and P. B. Syed Yahia Sahib and a report sent up. (Accounts since checked and report submitted on 20-8-22).

IX. Resolved tha tthe following members be nominated as Executive Members for the districts noted against their names.

(1) Mr. A. Rama Rau Pingale, Range Officer, Palakonda, Vizag.	... Vizagapatam District.

(2)	,,	M. N. Raman Pillai Range Officer, Begur Range	... Malabar South.
(3)	,,	P. S. Nair, Range Officer, Mannarghat Range.	... Do.
(4)	,,	M. Ambu, Range Officer, Sankaranarayana Range.	... Mangalore North.
(5)	,,	Mr. P. Miranda, Range Officer Upinangadi.	... Mangalore South.

M. MUTHUSAMI AIYAR,

Honorary President.

T. D. PONNIAH,

Honorary Secretary.

Contributions to the Gass Forest Museum.

Serial No.	Contribution.	Contributor.
1.	Eleven bark samples, Nine seedlings and Twelve botanical specimens.	F. D. Ardagh Esq., I. F. S.
2.	Four short panels, Four bark samples and Three seedlings.	M. R. Ry, M. Ambu, Range Officer, Sankaranaraina Range.

3.	Three sample boxes of matches, made at Gudur, (Nellore District.)—the boxes made of card board; and the sticks made of the wood of Gyrocarpus jacquini, Euphorbia antiquorum and grass stems.	C. E. C. Fischer Esq., I.F.S., Conservator, of Forests, III Circle.
4.	Botainical specimens of Xylia dolabriformis.	R. H. Mitchell Esq.
5.	Nine short panels of Evergreen species.	Captain H. A. Irwin, M. C. Forest Exploitation officer.
6.	Lettsomia elliptica, with a knot.	K. Looma shetty, M. F. C. 1922-24 Dn.

Additions to the Madras Forest College Library.

1. "Forest Research in India"—1920-21.
2. "Catalogue of the Exhibits in the Economic section of the Madras Government Museum,—except wood specimens" *—By, S N Chandrasekara Ayyar*, M. A.
3. Burma Forest Bulletion No. 6 Rough Volume Tables for Teak Tharawaddy Dn.—*By H. R. Blanford Esq.*

4. "Methods of communication adapted to Foreset Protection."

5. The Cambridge Bulletin No. XLI Feb 1922.

6. 'Lumbering and Wood-working Industries in the United States. Canada" III Volumes.--*By, F. A. Leete.*

7. (a) Progress Report of Forest Administration in the Province of Behar and Orissa for 1920-21—*By, E. R. Stevens Esq, I. F. S.*

   (b) Do. Do. in Punjab, for 1920-21.

8. Schedule of rates of the Coimbatore District Local Fund, P. W. Department for 1222-93.

9. Indian Forest Records:-
   Vol. VIII part (v).
   Vol. IX part (ii).

10. Ceylon Administration Report 1921.

11. Report of the Department of Industrires for the year ending 31—3—1921.

12. Proceedings and Resolutions of the Utilization Conference held during 16th to 21st January 1922 at Dehra Dun.

13. Proceedings of the Sylvivicultural Conference held in January 1922 at Dehra Dun.

14. Bulletins of Indian Industries and Labour, — *By, F. Marsden* (on paper and paper pulp production).

15. Madras Forest Bulletion No. 3. Sylvicultural Research in the Madras Presidency 1921-22.

16. Proceedings in the Revenue Department (Forests) in the Government of Bombay:—

February, to March 1920.
May, to November 1920.
January, to December 1921.

17. The Botany of Behar and Orissa,—*By, H. H. Haines,* *C.I.E., F.C H., F.L.S.*

(Part III—Calycifloræ).

18. "Mechanical, Physical, and Structural properties of wood grown in India."—*By, L. N. Seaman* M.A., B.Sc., A.M.E.I.C.

19. Nilambur Valley Working Plan, *By R Bourne,* I.F.S.

Vols. I and II—1917-18.

Vol. III—1919-21.

Vol. IV part (vii)- Maps showing the Nilambur and Amarapallam Rangers, and working circles 1917-18.

20. Control journal for the Mudumalai and Benne Forests (Nilgiri and Wynaad) for 1909-20—*By, J. H. Longrigg,* *I. F. S,*

21. Report of the Forest Department in Western Australia for the year ending 30—6—22.

* * * * * * *

We have pleasure to acknowledge, with thanks, receipt of a copy of "American Forest Regulation"—*By Theodore Salisbury Woolsey Jr. M. F.* (author of studies in French Forestry, etc. consulting Forester etc., Lecturer, yale school of Forestry, etc.)

The book is priced 18/- net, and published *by Messrs. Chapman and Hall 11 Henrietta Street, Convent Garden, London W. C.*

* * * *

The Principal, Madras Forest College, acknowledges with thanks, receipt of the following donations, promised by ex-students of the college, and paid during the period, September to December 1922.

Date of payment.	Name of ex-student.		Amount paid. Rs.	A.	P.
25-9-22	Mr. P. Dhanajaya Rao	...	13	0	0
Do.	„ L. A. Krishna Ayyar	...	7	0	0
Do.	„ D. Krishna Ayyangar	...	15	0	0
21-10-22	„ T. E. Varadachari	...	10	0	0
2-12-22	Do.	...	5	0	0
2-12-22	„ C. M. Ayyappasari	...	5	0	0

* * * * * * *

Statement showing amounts promised and still due by ex-students of the Madras Forest College, towards the Students' Club.

ed 5-14-0 on 21-12-22	Mr C. S. Ramanathan	...	...	~~10~~	14	0	5/- due
Recd .21-12-22	~~„ M. R. Doraisami~~	~~...~~	~~...~~	~~3~~	~~0~~	~~0~~	
„ „	~~„ Gulam Dastagir Sahib~~	~~...~~	~~...~~	~~9~~	~~0~~	~~0~~	
Recd: 12-1-23,-	~~„ S. A. Dawson~~	~~...~~	~~...~~	~~11~~	~~0~~	~~0~~	
	~~„ M Krishna Ayyar~~	~~...~~	~~...~~	~~10~~	~~0~~	~~0~~	
/- recd 23-12-22	„ S. V. Sigbatullahi Sahib		...	10	0	0	5/- due
	~~„ W. Balakrishna Mudaliar~~		~~...~~	~~10~~	~~0~~	~~0~~	
	~~„ P. V. Ramana Rao~~	~~...~~	~~...~~	~~12~~	~~0~~	~~0~~	
	„ R. E. Lemos	...	...	~~50~~	0	0	1-0-0

Balance Sheet of the Madras Forest College Magazine for the year 1921-22.

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^ arry Esq. recd.
during (22-23)

RECEIPTS.

Serial No.	Particulars.		Amount. Rs.	A.	P.
1	**Donations:-**				
	Donation from M. R. Ry. Rao Bahadur T. Numberumal Chetty Garu M.L.C.		25	0	0
	"Entrance donation" from:				
	1 Imperial officer	10-0-0			
	5 Officers of the Madras Forest Service @ Rs 5/- each	25-0-0			
	30 ,, ,, the Subordinate Forest Service @ Rs 2/-each	60-0-0	95	0	0
2	**Subscriptions:-**				
	(*a*) From 37 new members @ Rs. 2/-each		74	0	0
	(*b*) ,, 244 old ,, ,, ,,		488	0	0
	(*c*) Arrear subsn. for 1920-21 from 2 members @ Rs 1/- each		2	0	0
3	Recovery of V. P. Registration fee		27	1	0
4	Advertisements		139	10	0
5	Interest accrued on deposit in Bank		14	6	9
6	Cash balance with the Treasurer at the beginning of the year		24	12	2
7	Balance at Bank at the beginning of the year		325	9	0
	TOTAL.		1215	6	11

EXPENDITURE.

Serial No.	Particulars.	Amount. Rs.	A.	P.
1	White paper.	244	8	0
2	Art and tissue paper.	14	13	0
3	Cover paper.	26	2	0
4	Receipt books.	7	0	0
5	Printing Charges.	363	4	0
6	Binding ,,	30	0	6
7	Postal ,,	91	15	0
8	Sundries.	3	12	0
9	Cash Balance with Treasurer on 30-6-22.	13	2	8
10	Balance at Bank on 30-6-22.	420	13	9
	TOTAL.	1215	6	11

G. VISWANATHAM,
(Editor and Treasurer.)

A. R. BRAND,
(Business Superintendent.)

C. C. WILSON, I. F. S.
(President.)

The Madras Forest College Magazine.

Published Quarterly.

Rules regarding Subscription etc.,

1. For all classes of subscribers, an annual subscription of Rs. 2—0 0 (Two only) will be charged.

2 For the different classes of subscribers, an entrance donation will be charged as follows:—

(a) Foresters, Students of the Madras Forest College, and Rangers Rs. 2—0—0

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It is not intended that the magazine should be run at a profit. so that as our subscribers increase the magazine will be issued in a more attractive form. More illustrations, will then be possible.

It is the aim of the management to run the magazine for the Ranger-class (including Foresters) and mainly by their contribitions Correspondents are needed to supply suitable matter to maintain the magazine on these lines We feel confident that this appeal will not go in vain. There must be a number of our readers who have something of interest to write on.

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Lawley Road, P. O., Coimbatore.

South India.

Gazette Notifications.

22—8—22.

Mr. H. C. Bennett, Deputy Conservator of Forests, to act as Conservator of Forests from the 15th April 1921 to 17th October 1921.

Mr. F. D. Ardagh, Deputy Conservator of Forests, to be District Forest Officer, Palghat, from or after the 15th August 1922.

Mr. D. F. Stileman, Deputy Conservator of Forests, to be District Forest Officer South Vellore from or after the 20th July 1922

Saiyid Abdul Qadir Saheb Bahadur, Extra Assistant Conservator of Forests, to be District Forest Officer, Nilambur, from or after the 15th August 1922.

Mr. O. H. C. Shelswell, Deputy Conservator of Forests, has been granted by the High Commissioner for India an extension of leave for 3 months on Medical Certificate.

M. R. Ry. A. R. Narasimha Ayyangar Avl., Extra Assistant Conservator, from Palghat to the Chief Conservator's Office. To join as soon as possible.

M. R. Ry. M. H Krishnaswami Avl., Extra Assistant Conservator, from Palghat to Nilambur. To work under the orders of the District Forest Officer.

29—8—22.

Mr. H. B. Ward, District Forest Officer, Ganjam is granted leave on half average pay for 14 days from the 8th to 22nd September 1922.

M. R. Ry. C. M. Kushalappa, Avl, Extra Assistant Conservator of Forests, will be in charge of the District Forest Office and carry on the Routine work during the absence of Mr. H. B. Ward, on leave.

5—9—22.

Mr. B. K. Roy, Assistant Conservator of Forests is granted leave on average pay for one month with effect from the 22nd September 1922.

The following promotions of Forest Officers are ordered

Mr. K. A. Chengappa, Extra Assistant Conservator of Forests to the Imperial Forest Service vice Mr. F. A. Seager, retired.

Mr. George Venugopal, Extra Assistant Conservator of Forests to the Imperial Forest Service vice M. R Ry. V. Raman Menon Avl., deceased.

12—9—22.

Mr. R. Bourne, Deputy Conservator of Forests has been granted by the High Commissioner for India an extension of leave for 3 Months on half average pay

Mr J. H. Longrigg, Deputy Conservator of Forests has been granted by the High Commissioner for India an extension of leave for 4 days on half average pay.

The Services of Mr. C. J. Vanhaeften, Extra Assistant Conservator of Forests were replaced at the disposal of the Government of Madras with effect from the afternoon of the 23rd May 1922.

19—9—22.

Mr, Du Pre Thornton, District Forest Officer, North Coimbatere, is granted privilege leave for 3 Months from the 2nd November 1922, preparatory to his retirement.

26—9—22.

Mr. J. M. Sweet, Forest Research Officer is granted leave on average pay for one month from the 10th October 1922.

Mr. F. D. Ardagh, District Forest Officer, Palghat, will be in charge of the Office of the Forest Research Officer during the period of Mr. Sweet's leave.

Mr. F. X. Mascarenhas, Inspector of live stock is granted leave on average pay for 6 months with effect from the 22nd August 1922.

M. R Ry. S D. Devadoss Pillay Veterinary Assistant in charge of live stock in the Nilgiris is appointed as Acting Inspector of live stock during the absence of Mr. F. X. Mascarenhas or until further orders.

Mr. E. M. Crothers, District Forest Officer West Kurnool is granted leave on average pay for one month from 3rd January 1923 with permission to prefix the Christmas Holidays to it, provided the conditions of article 220 C. S. R. are fullfilled.

3—10—22.

Mr. H. C. Bennett Deputy Conservator of Forests has been granted by the High Commissioner for India an extension of leave for 3 months on half average pay.

Mr. H. W. A Goudoin, Deputy Conservator of Forests, on return from leave to be District Forest Officer South Vellore.

Mr. J. H. Longrigg, Deputy Conservator of Forests, on return from leave to be District Forest Officer Lower Godavari.

Mr C. J. Vanhaeften, Extra Assistant Conservator of Forests, on relief by Mr. J. H. Longrigg, is posted to work under the District Forest Officer, Lower Godavari.

Mr. D. F. Stileman, District Forest Officer, South Vellore, on relief by Mr. H. W. A. Goudoin, is posted to work under the Conservator of Forests Fourth Circle.

10—10—22.

With reference to Notification No. 256 Published on page 810 Part I of the Fort St. George Gazette, dated 22nd August 1922, Saiyid Abdul Quadir Sahib Bahadur, Extra Assistant Conservator of Forests is posted to Nilambur Division for special duty under the District Forest Officer, after his relief as District Forest Officer, South Vellore (afternoon of 22nd July 1922) up to the date on which he assumed charge of the Nilambur Division as District Forest Officer, (17th August 1922).

M. R. Ry. A. V. Sundaram, Extra Assistant Conservator of Forests, on probation, is transferred from Lower Godavari to West Cuddapah to work under the orders of the District Forest Officer.

17—10—22.

Mr. H. Tireman, acting Chief Conservator of Forests is granted leave on average pay for 4 months from or after the 12th November 1922.

Mr. D. McDcurrie, Assistant Conservator of Forests is posted to the charge of Puthur Range, South Mangalore Division.

Mr. R. Ry. P. Govinda Menon Extra Assistant Conservator of Forests is granted further extension of Extraordinary leave for one month and 26 days in continuation of the extension of leave granted to him in Chief Conservator's Proceedings No. 971 Routine dated 12—7—22.

Mr. R. H. Law, Assistant Conservator of Forests, Second Circle, is posted to be in charge of the Bellary District, temporarily, vice M. R, Ry. K. Gajaraja Mudaliar who has applied for leave.

Mr. D. F. Stileman, Assistant Conservator of Forests, attached to the Fourth Circle, is posted to the charge of the North Coimbatore Division during the absence of Mr. Du Pre Thornton on privilege leave. To join so as to relieve Mr. Thornton on the 2nd November 1922 (forenoon).

24—10—22.

M. R. Ry. E. B. Ramachandra Rao, District Forest Officer, Salem North is granted leave on average pay for 10 days with effect from the 2nd September 1922.

30—10—22.

The following postings of Forest Officers are ordered.

Mr. D. A. Stracey, Extra Assistant conservator of Forests on return from leave to be District Forest Officer Bellary.

Mr. M. C. Chandy, Extra Assistant Conservator of Forests, on return from leave, to be District Forest Officer, East Karnool.

Notifications Relating to Range Officers.

First Circle.

14—8—22.

1. M.R.Ry. A. Subrahmanya Ayyar, Ranger V Grade, Godavari Upper, is granted an extension of leave on average pay for two months in continuation of the 4 months privilege leave granted to him.

19—8—22.

2. M. R. Ry. C. G. Kishna, Ranger IV grade, Kistna District, is granted with effect from or after 1st October 1922 leave on average pay for 6 months and leave on half average pay for 6 months.

14—9—22.

3. M. R. Ry. A. Subrahmanya Iyer, Ranger V grade, Godavari Upper, is posted to Bandar Range to relieve Ranger M. R. Ry. C. G. Krishna on 1st October 1922.

4—10—22.

4. M. R. Ry. K. Venkatesam Naidu, supernumerary Ranger, Godavari Upper, is granted an extension of 10 days leave on full average salary to the three months' similar leave already granted.

13—10—22.

5. M. R. Ry. G. Appa Rao, Ranger V grade, is posted to the Rajahmundry Range and should releive M. R. Ry. A. V. Sundaram Avl., Extra Assistant Conservator on probation transferred to III Circle.

Second Circle.

22—8—22.

6 Application dated 16-8-1922 from Mr. Mahammad Asadulla Ghatala. Ranger V Grade (on leave) tendering resignation from service.

" The resignation is acccpted."

22—8—22.

7. M. R. Ry. T. K. Ramaswami Iyer Ranger II Grade, Sirvel Range, Kurnool South District, is granted leave on average pay for 3 weeks from 18th September to 8th October 1922 both days inclusive.

(2) M. R. Ry. V. N. Subramanya Iyer, Superuumerary Ranger on special duty in Anantapur District is posted to charge of Sirvel Range Kurnool South. To relieve No. 1 on the forenoon of 18th September 1922.

23—8—22.

8. M. R. Ry. S. Chinnadurai Pillai, Ranger II Grade in charge of Gooty Range, Anantapur District is tranferred to Giddalore Range in Kurnool South District.

(2) On relief by No. 1 Mr. A. Joseph Ranger VI Grade in charge of Giddalore Range is transferred to Gooty Range. Anantapur District.

27—8—22.

9. Mr. Syed Ibrahim Albeiz, Ranger III grade on Special duty in Kurnool South is granted leave on half average pay on medical certificate under rule 81 (c) of the Fundamental rules for 2 months from 25th July 1922.

27—8—22.

10. M. R. Ry. C. Rama Rao, Ranger IV Grade posted to Gundlabrahmeswaram Range, Kurnool west is granted an extension of leave on average pay for 2 months and 26 days from 17-8-22.

This cancels his posting to Gundlabrahmeswaram Range.

(2) B. Krishna Rao Supernumerary Ranger now in charge of G. B. M. Range to continue as such till further orders.

15—9—22.

11. M. R. Ry. T. M. Krishnamachary, Supernumerary Ranger on return from leave is posted to Kurnool South for special duty.

(2) The District Forest Officer is requested to inform him where he is to take charge on 1-10-22 when he is due back from leave.

19—9—22.

12. M. R. Ry. M. Subbarayalu Naidu Ranger III from Adoni Range of Bellary District to charge of Bairluti Range of Kurnool West Division.

(2) M. R. Ry. N. Sundaresa Ayyar Ranger III from Bairluti to Adoni Range. He should relieve No. 1.

30—9—22.

13. M. R. Ry. A. Bhaviah Ranger, VI Grade, Kadiri Range is granted leave on average pay for 1 month with effect from date of relief by No, 2.

(2) M. R. Ry. T. M. Krishnamachary, Supernumerary Ranger, is granted an extension of one week's leave in continuation of the leave granted to him.

On the expiry of his leave i. e., on 8-10-22 he should forthwith without availing, any joining time, join at Kadiri to take charge of Kadiri Range, Anantapur District. This cancels the posting of this ranger to Kurnool south ordered in this office S. O. No 74 dated 18-9-22.

2—10—22.

14. M. R. Ry. A. Vyasulu, Ranger VII Grade, on expiry of his leave i. e. on 17-10-22, is posted to special duty in Kurnool South to work under the orders of the District Forest Officer.

5—10—22.

15. M. R. Ry. T. K. Ramaswamy Ayyer, Ranger II Grade is granted an extension of leave on average pay for one month in continuation of the 3 weeks leave already granted.

(2) The existing arrangements to continue until further orders.

15—10—22.

16. Mr. Syed Ibrahim Albeiz Ranger III grade is granted extension of leave not due on medical certificate under Rule 81 (c) of the Fundamental rules for 6 weeks in continuation of the leave already granted.

14—10—22.

17. Mr. Law, Assistant Conservator on assumption of charge of the District Forest Office, Bellary will hand over charge of Kudligi Range to Supernumerary Ranger T. Sreeramulu Nayudu, on relief by the permanent District Forest Officer. Mr. Law will take charge of Bellary Range from Ranger M. Krishna Rao who will remain in Bellary Range for the present on special duty as Mr. Law's Assistant.

17—10—22.

18. (1) Mr M Hussain Khan, Ranger II Grade on expiry of the leave granted in this office S. O. No. 28/22 dated 4-4-22 is posted to Dhone Range, Kurnool West.

(2) Mr. J. B. Rodrigues, Supernumarary Ranger, on relief by No. 1 to be on Special duty in the same division.

24—10—22

19. M. R. Ry. G. Rama Rao Ranger IV Grade is reposted to Gundlabrameswaram Range, West Kurnool District on expiry of the leave granted to him in S. O. No. 70/22 dated 29-8-22.

(2) Supernumarary Ranger M. R. Ry. B. Krishna Rao now in charge of the Range, on relief, to be on special duty in the same district.

30—10—22.

20. (1) M. R. Ry. A. Bhaviah, Ranger VI Grade on return from leave is posted to Morricheruvu Range (Kurnool East Division) vice Ranger I. John applied for leave. He should relieve Ranger I. John by 10th November 1922.

(2) M. R. Ry. B. V. Jogeswara Rao, Ranger V Grade on return from leave is posted to Kadiri Range (Anantapur District) and will relieve Supernumerary Ranger, T. M. Krishnama Chari.

(3) Supernumerary Ranger, T. M. Krishnama Chari after relief will work in Anantapur Division under the orders of the District Forest Officer.

4—11—22.

21. Mr. M. Hussain Khan, Ranger II Grade who has been posted to Dhone Range in this office S. O. No. 83/22 dated 17-10-22 is granted an extension of leave on full average pay on medical certificate for 2 months in continuation of the leave already granted,

4—11—22.

22. Mr. I. John, Ranger VII Grade in charge of Morricheruvu Range E. Kurnool is suspended for 3 months from date of relief, vide II Circle, Conservator's proceedings dated 30-10-22 on the charge sheet framed against him by the District Forest Officer, East Kurnool.

4—11—22.

23. Ranger Syed Ibrahim Albeiz Sahib, III Grade, on leave will join Kurnool South District for special duty on his return from leave.

6—11—22.

24. (1) M. R. Ry. T. K. Ramaswamy Iyer Ranger II Grade is granted an extension of leave already granted to him in this office S. O. No. 80 of 22. dated 5th October 1922.

(2) M. R. Ry. A. Vyasulu Ranger VII Grade on return from leave to charge of Sirvel Range, Kurnool South in cancellation of S. O. No. 78/22 dated 2-10-22.

(3) M R. Ry. V. N. Subrahmanya Iyer, Supernumerary Ranger in charge of Sirvel Range on relief by No. 2 to be on Special duty Kurnool South Division.

9—11—22.

25. (1) The leave on average pay for one month granted to Ranger, A. Baviah is extended by 20 days.

(2) M. R. Ry. P. Gopalan, Supernumerary Ranger on special duty in West Kurnool is posted to Morricheruvu Range, East Kurnool, vice No. 1 on leave or until further orders. To join forthwith and relieve Ranger I. John now in charge of the Range.

Third Circle.

12—8—22.

26. The extension of leave granted to Ranger M. R. Ry. S. Sankara Alwa in this office Service Order No. 41/22 dated 28th June 1922 is further extended to 16th July 1922 (inclusive).

12—8—22.

27. In modification of this office Service Order No. 54 of 1922 dated 6th August 1922, M. R. Ry. S. Sankara Alwa Ranger VI grade permanent (and reduced to VII grade temporarily) is granted leave on average salary for 2 months and 29 days from 23rd July 1922 and extraordinary leave without allowances for 2 years in continuation thereof with a lien on his appointment as Ranger VI grade.

17—8—22.

28. Ranger P. M. Mathew is transferred to the Madanapalli Range of the Chittoor District, in relief of Mr. B. K. Roy.

Mr. Roy on relief by Mr. P. M. Mathew is posted to do duty under the District Forest Officer Chittoor with head-quarters at Chittoor.

25—8—22.

29. The unexpired portion of a day's privilege leave granted in this office Service Order No. 54/21 dated 15th May 1921 to M. R. Ry. T. Paramasivam Pillai Ranger V grade is cancelled.

4—9—22.

30. Ranger M.R.Ry. K. R. Viswanatha Ayyar is transferred to West Cuddapah Division for charge of the Cuddapah Range in relief of M. R. Ry. B. Chenchurama Nayudu granted leave. To join not later than 16th September 1922.

Ranger M. R. Ry. B. Chenchurama Nayudu is granted 2 months privilege leave from date of relief.

8—9—22.

31. Mr. Saiyid Riaz-ud-din Sahib Bahadur, Extra Assistant Conservator of Forests attached to the Nellore District is transferred to the South Cuddapah Division for duty under the District Forest Officer with headquarters at Cuddapah.

11—9—22.

32. (1) M. R. Ry. K. Raghuraman acting Ranger VII grade on return from leave granted in this office Service Order No. 50/22 dated 30-7-22 is posted to special duty under the orders of the District Forest Officer North Cuddapah, Cuddapah.

(2) M R. Ry. C R Rajagopala Ayyangar Ranger VI grade in charge of Vonipenta Range, North Cuddapah District, on relief by M. R. Ry. A. Muthukrishnan Ranger VI grade on return from leave (granted in this office Service Order No. 39/22 dated 21st June 1922) is posted to special duty under the orders of the District Forest Officer Chittoor.

5—11—22.

33. M. R. Ry. B. Chenchurama Nayudu Ranger IV grade on return from leave is posted to the charge of Sanipaya Range West Cuddapah District.

(2) M. R. Ry. D. Krisnaswamiah Supernumerary Ranger in relief by No. 1 is ordered to remain attached to West Cuddapah Division until relief to join the Vernacular Training School 1923 in January 1923.

5—11—22.

34. M. R. Ry, T. M. Duraiswamy Pillai Ranger V grade in charge of Palmaner Range, Chittoor District is appointed to be the

Senior Instructor Vernacular Training School 1923 session to be held in North Cuddapah District.

(2) M.R Ry. D. Krishnaswamiah Supernumerary Ranger in charge of Sanipaya Range West Cuddapah District is appointed to be the Junior instructor Vernacular Training School 1923 Session to be held in North Cuddapah District.

Orders about the relief of No. 1 above will be issued in due course.

Fourth Circle.

13—8—22.

35. M. R. Ry. M. Packyanathan, Ranger II grade, is granted an extension of 6 months' leave on medical certificate from 11-6-22 i. e., leave on average pay for 3 months and 9 days and the rest on half average pay.

25—8—22.

36. In continuation of this office Service Order No. 67 of 1922, M. R. Ry. C. D. Parthasarathi Chetti, Ranger IV grade, is granted extension of leave for 6 months (leave on average salary for 2 months and leave on half average salary for 4 months) from 15.8-1922.

28—8—22.

37. M. R. Ry. T. D. Ponniah, Ranger V grade, in charge of Polur Range, is granted leave on average salary for three months from 3rd September 1922, or date of relief.

(2) M. R. Ry. M. S. Krishnaswami Ayyangar, Supernumerary Ranger on special duty, is posted to the charge of Polur Range Vice No. 1 on leave or until further orders.

1—9—22.

38. M. R. Ry. M. Packyanathan, Ranger II grade is, on return from leave, posted to the charge of Atur Range, East Salem Division.

6—9—22.

39. M. R. Ry. L. R Narayana Ayyar, *sub pro tem* Ranger II grade in charge of Atur Range, East Salem Division, is placed under suspension pending disposal of charge against him.

(2) M. R. Ry. P. Sithapathi Ayyar, Supernumerary Ranger, Central Salem Division, is posted to the charge of Atur Range. He will relieve No. 1 at once and hold charge of the Range until relieved by Ranger M. Packyanathan from leave. He will then return to Central Salem Division.

7—9—22.

40. M. R. Ry. T. D. Rajabahadur Mudaliar, Ranger VI grade, Central Salem Division is reduced to VII grade for 15 days from 7-9-22.

41. M. R. Ry. T. K. Parthasarathy Ayyangar, Special duty Ranger, Tirupatur Range, is granted leave on average salary for 15 days from 21st August 1922.

17—9—22.

42. M. R. Ry. T. K. Parthasarathi Ayyangar, Special duty Ranger. Tirupatur Range is granted an extension of 15 days leave on average salary from 5-9-1922 in continuation of this office S. O. No. 214-22, dated 27-8-1922.

30—9—22.

43. M. R. Ry. T. K. Parthasarathi Ayyengar, Ranger VI grade on special duty, West Vellore Division, is granted extension of leave for one month on average salary from 21-9-1922.

7—10—22.

44. In continuation of this office Service Order No. 101 of 1922. S. Ramalinga Ayyar, Supernumerary Ranger, is granted extension of leave for 2 months on average pay from 1-10-1922.

13—10—22.

45. M. R. Ry. R. Subramania Ayyar, Ranger III grade, is granted extension of leave for 6 months (on average salary for one month and 25 days and half average salary for 4 months and 5 days) from 7-10-1922.

1—11—22.

46. M. R. Ry. M. Pakyanathan, Ranger II grade, having been permitted to join duty before the expiry of his leave granted to him in Service Order No 107-22, dated 13-8-1922, the unexpired portion of the leave from 24-10-1922 to 10-12-1922 both days inclusive, is cancelled.

6—11—22.

47. In modification of this office Service Order No. 67-22, dated 29-4-1922 and 110-22, dated 25-8-1922, M. R. Ry. C. D. Parthasarathi Chetty, Ranger IV grade, is granted leave for 1 year (leave on average salary for 8 months and leave on half average salary for 4 months) from 15-2-1922.

9—11—22.

48. Ranger S. G. Venkataraman, *sub pro tem* V grade has been reduced from 1-11-1922 for 6 weeks to the next lower grade,

Fifth Circle.

10—8—22.

49. The leave on average pay for a month granted by the D. F. O., North Coimbatore to M. R. Ry. V. Jaganatham Pillai, Ranger VII grade, from 8th May last in his S. O. No. 181 of 22 dated 8th June 22 is extended by one month.

4—10—22.

50. M. R. Ry. S Shunmugha Kumaran Pillai, Ranger II grade, in charge of Palni Range, Madura District, is granted leave on average pay for four months and commuted furlough on average pay for 2 months in continuation under the fundamental rules, with effect from date of relief.

(2) M. R. Ry. P. Ramaswamy Ayyar, Ranger VI grade is posted to charge of Palni Range to relieve No. 1.

13—10—22.

51. On 1st December 1922 Ranger Mr. Culas of Kollegal Range will hand over charge to the Range Officer Ramapuram and will proceed to take charge of the Bhavani Range North Coimbatore District from Ranger M. R. Ry. M. Rama Rao Kini. On relief by Ranger Mr. Culas Ranger M. R. Ry. M. Rama Rao Kini will take charge of Kollegal range, Kollegal Division. The usual joining time may be taken in each case.

Sixth Circle.

21—8—22.

52. M. R. Ry. S. V. Duraiswami Ayyar, Ranger VII grade sub pro tem is, on the expiry of his leave, posted for special duty in South Mangalore Division.

20—10—22.

53. M R. Ry. M. N. Raman Pillai, Ranger V grade is granted leave on average pay, under article 81 of the Fundamental rules, from 1st September 1922 to 4th October 1922.

23—10—22.

54. Under rule 81 (b) of the Fundamental rules, M. R. Ry. A. G. Jesudasan Pillai, Ranger V grade in charge of Sigur range,

Nilgiris, is granted leave on average pay for 3 months from date of relief.

(2) M. R. Ry. S. V. Doraiswami Ayyar, Ranger VII grade sub-pro-tem on special duty, is transferred from South Mangalore to the Nilgiris for the charge of Sigur range. To join as early as possible.

(3) Mr. H. Myers, Ranger IV grade sub-protem is on the expiry of his leave posted for special duty in South Mangalore.

3—11—22.

55 (1) Mr. H. Myers, Ranger IV grade sub-protem on return from leave to the charge of Mannarghat range. This cancels his posting to South Mangalore Division ordered in this office S. O. No. 70 of 22 dated 23rd October 1922.

(2) P. Sankunni Nair, Supernumerary Ranger from Mannarghat range to South Mangalore Division for special duty.

21—10—22.

56. The following promotions in the class of rangers are ordered .—

(i) With effect from 1st June 1922 *vice* Mr. J. A. Paul D'Cruz, Ranger III grade *sub-protem* on other duty as Forest Assistant, Balliguda.

To III grade sub-protem.

M. R. Ry. K. M. Gopala Acharya, Ranger, IV grade.

To IV grade sub-protem.

M. R. Ry. K. Balakrishna Rao, Ranger, V grade.

To V grade sub-protem.

M. R Ry. B. T. Sitarama Ayyar, Ranger, VI grade.

To VI grade sub-protem.

M. R. Ry. G. V. Subba Rao, Ranger, VII grade.

To VII grade sub-protem.

M. R, Ry. K R. Subrahmanyam, Supernumerary ranger.

(ii) With effect from 14th July 1922 *vice* M. R. Ry. N. E. Kanakayya, Ranger, IV grade, deceased.

To VII grade permanent.

M. R. Ry. A. Ramamritha Pingale, Ranger, VII grade *sub-protem.*

To VII grade sub-protem.

M. R. Ry. P. Kannan, Supernumerary ranger

(iii) With effect from 24th July 1222 *vice* M. R. Ry. K. L Muniswami Ayyar, Ranger, I grade *sub-protem* and II grade permanent retired from service.

To II grade permanent

M. R. Ry. P. Ramunni Menon, Ranger, II grade, *sub-protem.*

To III grade permanent,

Mr. J. A. Paul D'Cruz, Ranger, III grade *sub-protem.*

To IV grade permanent.

M. R. Ry. K. Balakrishna Rao, ranger, IV grade *sub-protem.*

To V grade permanent,

M. S. A. Dawson, Ranger, V grade *subprotem.*

To VI grade permanent.

M. R. Ry, M. Sankaran Nair, Ranger VI grade *subprotem.*

To VII grade permanent.

M. R. Ry, S. V. Duraiswami, Ranger, VII grade, *sub-protem*.

To I grade sub-protem.

M. R. Ry, C. Rajagopala Nayudu, Ranger, II grade.

To II grade sub-protem.

Mr. L J. Taylor, Ranger, III grade.

To III grade sub-protem.

M. R. Ry. C. G. Ganapathi Ranger IV grade.

To IV grade sub-protem.

M. R. Ry, K. S. Ramaiya, Ranger V grade.

To V grade sub-protem.

P. B. Saiyid Yahia Sahib, Ranger, VI grade.

To VI grade sub-protem.

M. R Ry, R. Jagannatham Nayudu, ranger, VII grade.

To VII grade sub-protem.

M. R. Ry. R. Thangavelu Pillai, Supernumerary ranger.

(iv) With effect from 25th July 1922 *vice* M. R. Ry. G. Rama Rao ranger, III grade, reduced to the bottom of the IV grade.

To III grade Permanent.

Mr. C. S. King, ranger III grade *sub-protem*.

To III grade sub-protem.

M. R. Ry. M. Ambu, ranger IV grade.

57. The following promotions are ordered with effect from 14-8-22 *vice* Muhammad Asadullah Ghatala Sahib, ranger V grade resigned.

To V grade permanent.

M. R. Ry. I. Govindasami Pillai Ranger, V Grade *sab-protem.*

To VI grade Permanent.

Abdul Rahim Khan Sahib, ranger VI grade, *sub-protem.*

To VII grade Permanent.

M. R. Ry. K. R Subrahmanyam, ranger, VII grade *sub-protem.*

To V grade sub-protem.

Saiyid Vazi-ud-din Sibgat-ullah Sahib, Ranger, VI Grade.

To VI grade sub-protem.

M. R. Ry. M. Narasinga Rao Nayudu, Ranger VII grade.

To VII grade sub-protem.

M. R. Ry. T. Sriramulu Nayudu, Supernumerary ranger.

Advertisement.

The following is a list of specimens required for the Gass Forest Museum. The Principal will be gratcful to officers who can procure such of them as are available in their division The long panels should be approximately 5 feet long, 3 inch thick and as broad as available; the blocks 1 foot × 9 inch × 3 inch and the bark pieces about 6 inch sequare.

Species.	Long panel required	Short panel required	Block required	Bark pieces required
Aglaia Roxburghiana ...	1	1	1	1
Aquilaria Agallocha ...	1	1	1	1
Albizzia procera ...	1	0	0	1
Acacia dealbatta ...	1	1	1	1
Acrocarpus fraxinifolius ...	1	0	0	1
Chickrassia tabularis ...	1	1	1	1
Dillenia indica ...	1	0	1	1
Diospyros tomentosa ...	1	1	1	1
Diospyros paniculata ...	1	1	1	1
Diospyros Ebenum ...	0	1	0	0
Dalbergia sissoo ...	1	1	1	1
Erythroxylon monogynum.	1	1	1	1
Gmelina arborea ...	0	1	0	1
Grewia asiatica ...	0	1	1	1
Holoptelia integrifolia ...	0	0	0	1
Hydnocarpus Wightiana ...	1	0	0	1
Hereteria papilio ...	0	1	1	1
Litsaea zeylanica ...	1	1	1	1
Machilus macarantha ...	0	1	1	0
Premna tomentosa ...	1	1	0	1
Sterculia foetida ...	1	1	0	1
Sterculia villosa ...	1	0	0	1
Sterculia guttata ...	1	0	0	1
Stereospermum chelonodies	1	0	0	1

The following numbers of the "Indian Forestor" are required for the *Students'* Library. The Principal will be glad to receive any that officers can spare:—

1. Volume 1, 2 and 3 for 1875-76 1876-77, and 1878-79.
2. Volume 6 for 1880-81.
3. Volume 14 for 1888-January, February, March, April September, October, and December numbers.
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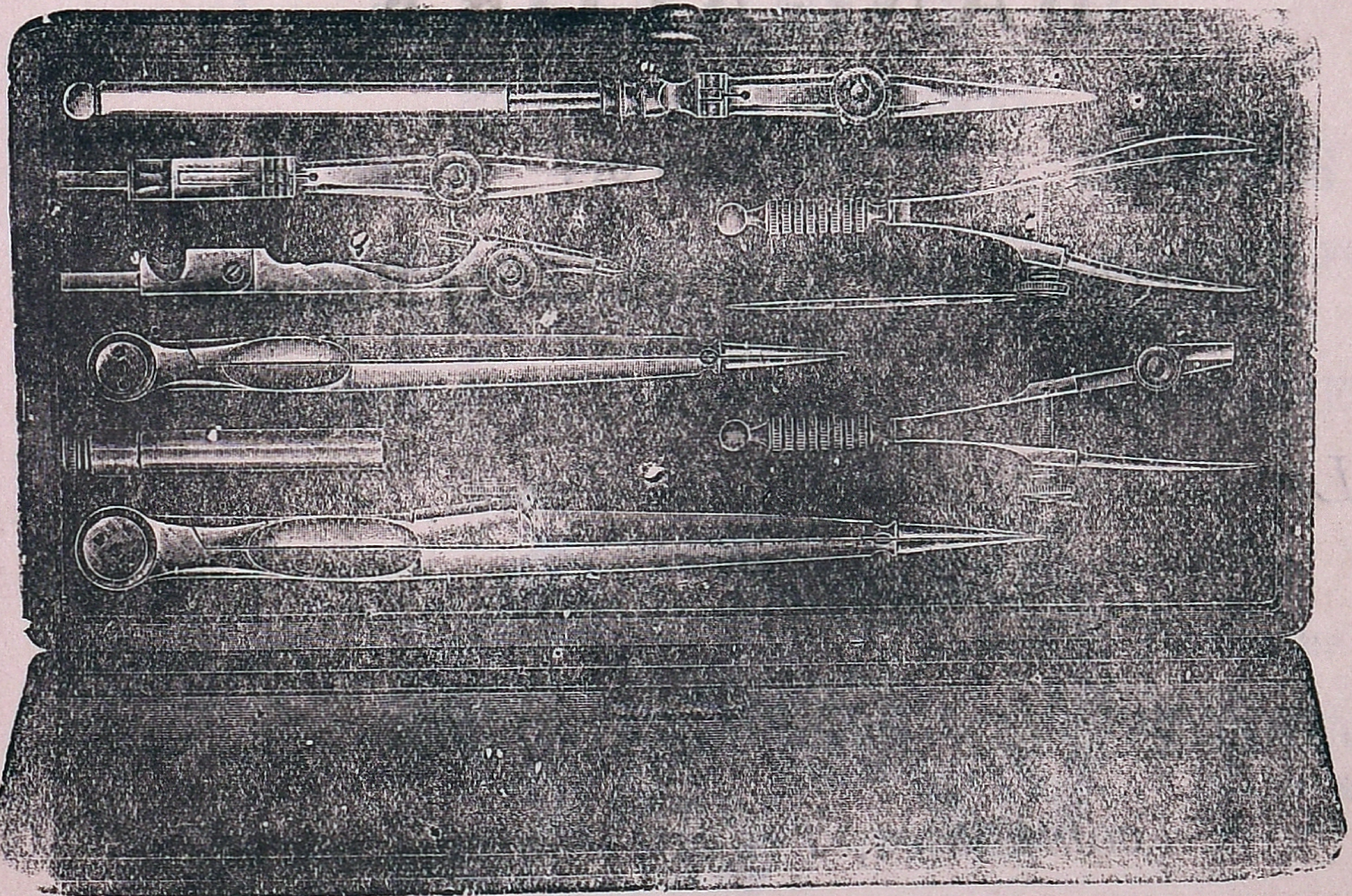

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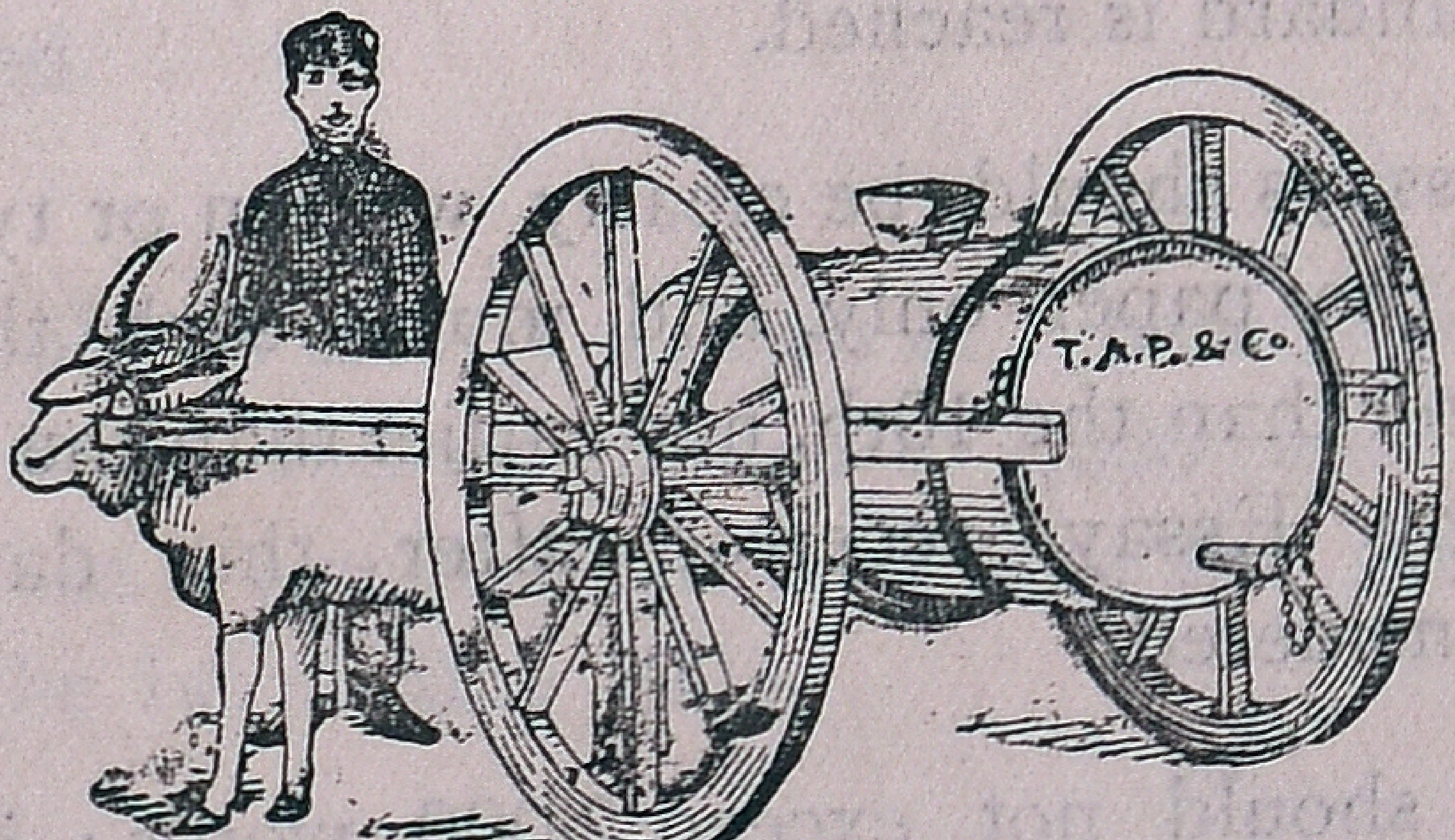

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Essays should not exceed 2,000 words; in previous years students have been disqualified for infringing this rule.

Each Essay must bear a motto; this motto is also to be written on the outside of a sealed envelope inside which is a paper containing the name of the competitor; the name of the competitor must not appear on the outside of the envelope, and must not be written on the Essay. Each Essay must be the *bonafide* unaided work of the Competitor submitting it

* * * * * * *

II

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